ELECTRICAL WEST

June 1951
25 cents

19th Annual Convention-in-Print

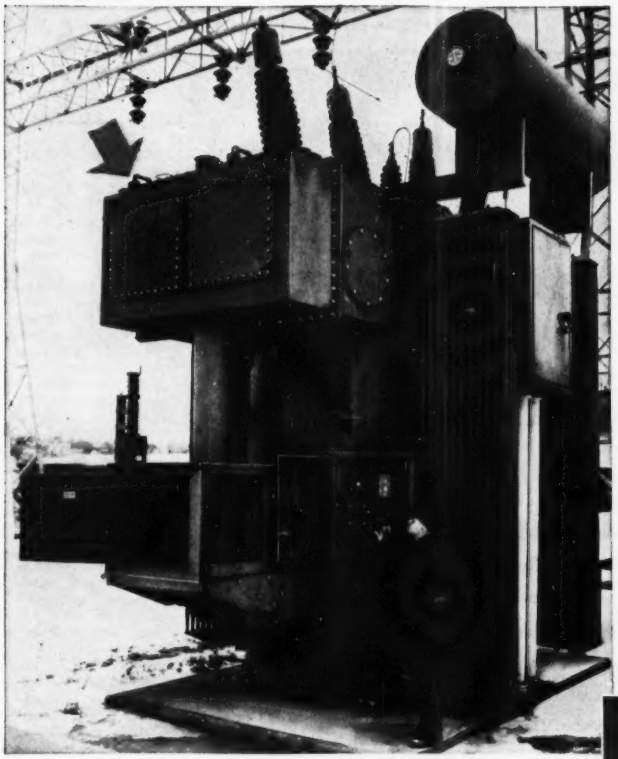
SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

yes...you!

Every homemaker is interested in what this series of Edison advertisements offers — more freedom, more time away from housekeeping chores, extra hours to spend doing things she enjoys — something every woman wants and needs, these busy days!

So it is sound selling strategy to help every homemaker—including the ones who are *your* customers—identify herself with one happy result of having a modern electric range. These advertisements tell her *how* to get extra hours every day, and *where* to get them, too. If you're in the business of selling electrical appliances, you'll recognize the formula: Edison tells them and the dealer sells them.

SOUTHERN CALIFORNIA EDISON COMPANY



At its current rate of operation the load-ratio-control equipment on this G-E transformer at Lewiston, Maine, will require no servicing until about 1962.

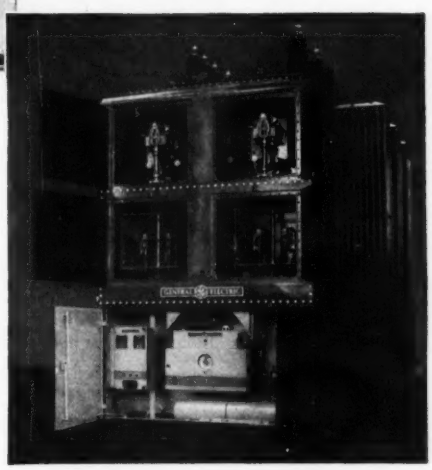
106,554 tap changes since 1947

Arcing tips inspected, found good for 400,000 more operations

Central Maine Power Company recently inspected the load-ratio-control equipment on this transformer rated 13,333 kva (with fans), 115,000Y to 12,000-volts. This was the first opportunity the company had to inspect contacts since installation in 1947. The counter read 106,554 tap changes under load. Here are pertinent parts of the report:

> "*Arcing tips are in good condition, and should last 500,000 tap changes as estimated in the G-E Instruction Book. All bearings, pins, cam rollers and cam surfaces are in excellent condition and show no wear. Oil was slightly carbonized and insulating rods and panel showed some carbon streamers, but there were no carbon deposits in the areas protected by electrostatic shielding. Oil was filtered and re-used. Surfaces were cleaned.*"

This report is typical. *At its present rate of operation, this equipment will not require further servicing for about 11 more years.* General Electric has now installed load-ratio-control equipment on 37,665,618 kva of transformers—and the reliability record matches the outstanding record of the transformers themselves. *General Electric Company, Schenectady 5, New York.*



On more recent G-E transformers the contactor compartment is below the one for tap selectors instead of in front of it, to further improve accessibility. The motor drive has also been made more accessible and all controls have been grouped on a hinged panel for operating convenience. Basic design, however, remains unchanged, including electrostatic shielding that prevents dangerous carbon deposits.

401-20

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty western cities.

JUNE 1951

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S. The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal," "Journal of Electricity, Power and Gas" and "Journal of Electricity." Contents copyright. Sixty-third year of publication

VOL. 106 NO. 6

ELECTRICAL WEST

George C. Tenney, Editor
W. A. Cyr, Associate Editor — Walter C. Heston, Engineering Editor
Peggy Boyer, Assistant Editor — John Coots, Typography

Next Month

With the big "Convention-in-Print" issue behind us, the July number will be back to normal. Several features of special interest are planned. There will be an article of exceptional interest on the subsidence of the 451,000-kw Long Beach steam station of Southern California Edison Co. The island on which it is located is sinking at the rate of 1½ ft. a year, and at the same time compressing. This has given rise to some unusual problems.

Tie line load control to increase the power transfer capabilities of inter-system and inter-company ties is a currently live subject. There will be an article describing the system-wide installation being made by a large Western utility. Closely related is the subject of communication and there will be another timely piece on microwave.

An article dealing with one of the latest new Western steam plants will be another feature.

In the lighting and wiring section will be found a piece on an outstanding lighting job in a Denver bank. Method of handling the service and type of distribution used in the Capitol Annex at Sacramento will be interesting reading to consultants and contractors.

Associationwise, there will be reports of the annual meetings of the two large West Coast electrical associations.

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Cover photo: A section of the audience at first Hawaiian convention conference of PCEA, Nov. 30-Dec. 1, 1950, in Honolulu. The second conference is scheduled for Nov. 29-30, 1951, at the Royal Hawaiian Hotel.

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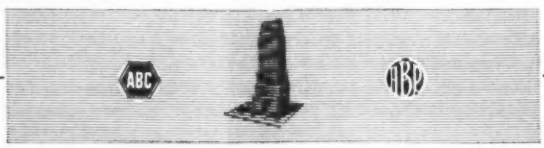

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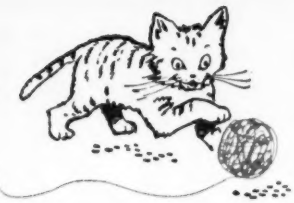


Quiet as a kitten

ELIMINATE NOISE AND RADIO TROUBLES ON 24.9 GR.Y/14.4 KV SYSTEMS WITH THIS L-M ROUND-WOUND TRANSFORMER

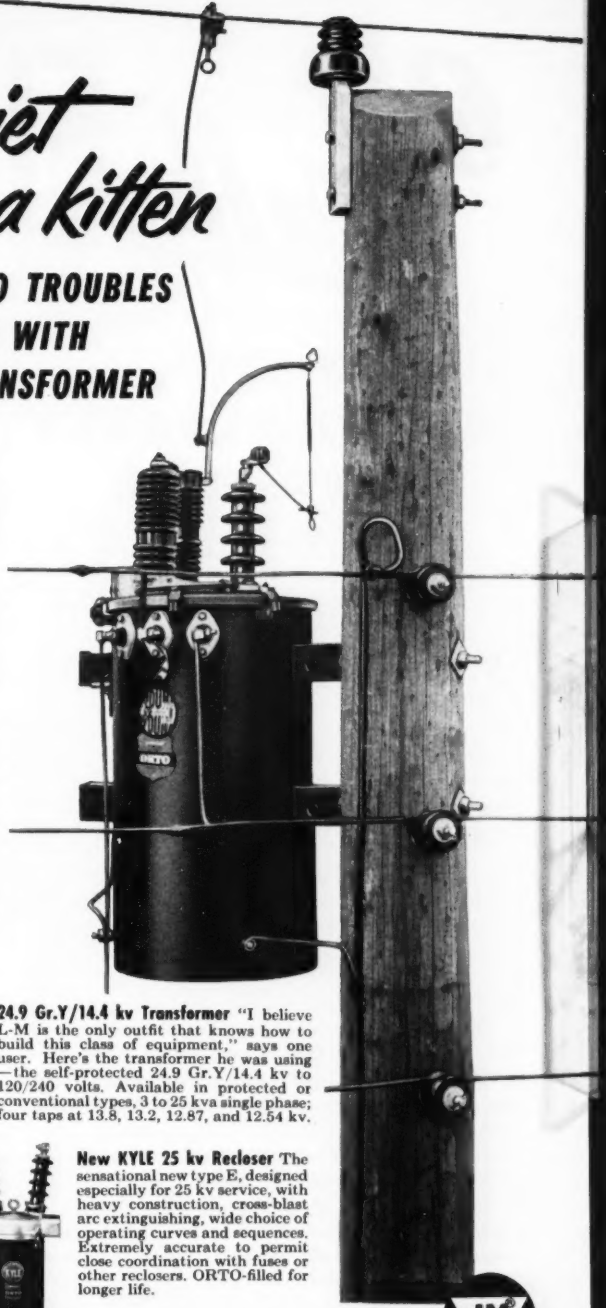
• Loose cores and leaky bushings can make lots of trouble on 24.9 Gr.Y systems. Some cores get loose and hum annoyingly. The radio noise from a poorly designed bushing can drown out a distant broadcasting station—which doesn't make the neighbors happy.

L-M has built a Round-Wound® transformer especially for this service—with a core that's quiet as a whisper—it is wound from continuous strip steel, and not cut; it stays quiet!

Oil-filled bushings are specially designed and processed—they give NO radio interference.

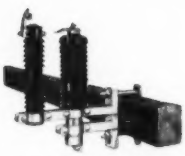
Like all Round-Wound transformers, this one has a high impulse level and high overload capacity.

The transformer and coordinated equipment have all been thoroughly tested in actual use in a number of locations throughout the country; they offer long life and dependable, economical service. Ask the L-M Field Engineer who calls on you for all the details; or write Line Material Company, Transformer Division, Zanesville, Ohio (a McGraw Electric Company Division).



24.9 Gr.Y/14.4 kv Transformer "I believe L-M is the only outfit that knows how to build this class of equipment," says one user. Here's the transformer he was using—the self-protected 24.9 Gr.Y/14.4 kv to 120/240 volts. Available in protected or conventional types, 3 to 25 kva single phase; four taps at 13.8, 13.2, 12.87, and 12.54 kv.

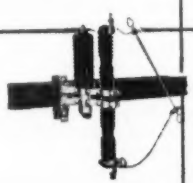
COMPLETE COORDINATED EQUIPMENT FOR 24.9 GR.Y/14.4 KV SYSTEMS



Heavy Duty Expulsion Arrester Type PF-3, 18 kv with 65,000 amp surge capacity, gives dependable protection to transformer and system.

New 24.9 Gr.Y/14.4 kv Cutout Swivel type hanger; double entrance contacts permit fusing from either side. Silver-plated solid phosnic bronze spring and contact assembly—no steel core to nick and rust!

New KYLE 25 kv Recloser The sensational new type E, designed especially for 25 kv service, with heavy construction, cross-blast arc extinguishing, wide choice of operating curves and sequences. Extremely accurate to permit close coordination with fuses or other reclosers. ORTO-filled for longer life.



Combination Arrester and Cutout Choice of swivel hanger for crossarm mounting, shown here; or for transformer mounting (shown on transformer above), top can be rotated to assure vertical fuse mounting on any size or make transformer regardless of tank diameter.

49

LINE MATERIAL —Transformers

Complete Coordinated Equipment for Distribution Today

Get Full Electrical

WITH MECHANICALLY TRIP-FREE PNEUMATIC OPERATION

YOUR CIRCUIT BREAKER is a long term investment that pays dividends daily in protection for your electrical system. Naturally, you want full electrical protection — the best protection your money can buy. That's an important reason why your pneumatically operated circuit breakers should be mechanically trip-free. Unless they're mechanically trip-free they may fail to reopen properly when closed against a fault condition.

TRIP-FREE ADVANTAGES

Opening action of Allis-Chalmers pneumatically operated breakers is immediate and positive, because tripping instantly uncouples contacts from the closing mechanism. Opening occurs whether the breaker is in normal closed position or is "closing in" on a short circuit.

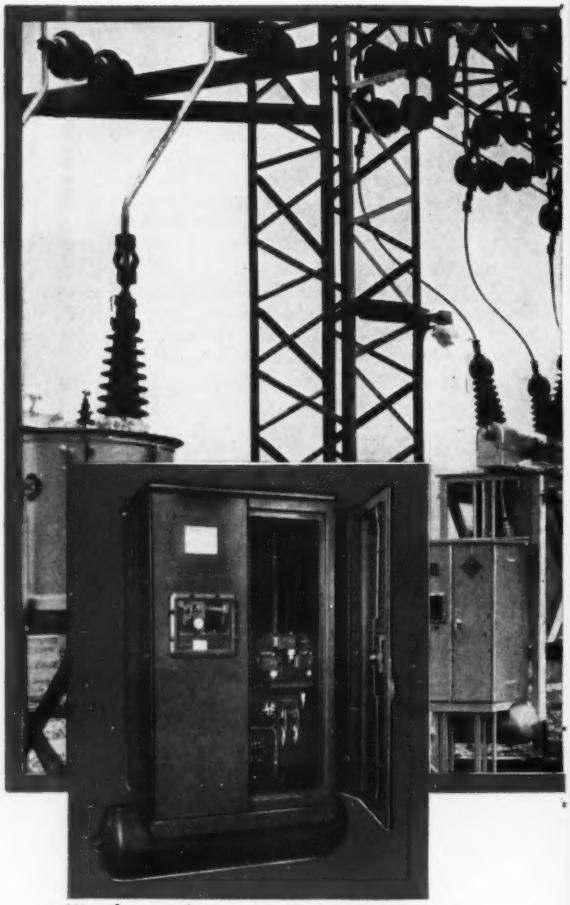
Breaker opening is independent of the closing piston and air valves. There is no drag from the closing mechanism.

Designed for high speed (20 cycle) reclosing, these breakers combine fast acting power of pneumatic operation with fast recoupling of contacts and reclosing mechanism. Stored energy for fast closing comes from a self contained air pressure tank with compressor.

You can gain the advantages of mechanically trip-free operation in every Allis-Chalmers power oil circuit breaker — whether pneumatically, solenoid or manually operated. It is standard in all sizes and ratings.

More than one-half century of experience stands behind the dependable operation of these breakers, serving industry since 1899. This dependability is being proved daily in utility and industrial installations coast to coast.

Call your Allis-Chalmers district office for more information on power oil circuit breakers. Or write Allis-Chalmers, Milwaukee 1, Wis., for your copy of the mechanically trip-free pneumatic operator bulletin. A-3355



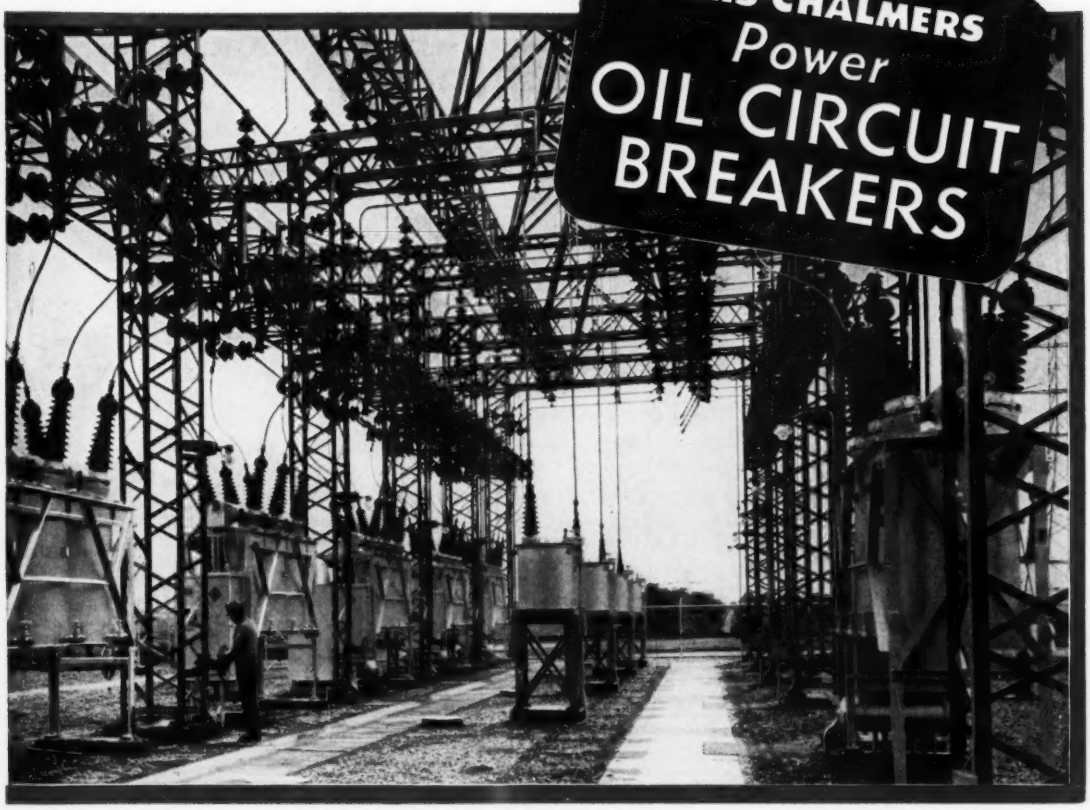
Weatherproof operator housing furnishes double protection against moisture.

For keeping out wind-driven weather, double doors with full length hinges are recessed. They have provisions for gasketing. The large safety glass window in the door permits a quick check of air pressure gauge, position indicator, operation counter and nameplate.

The operator is protected against condensation. The air tank is outside of housing. Thermostat controlled electric heaters keep both the operator and housing interior above ambient temperature. All parts are rustproof.

Protection

ALLIS-CHALMERS
Power
OIL CIRCUIT BREAKERS



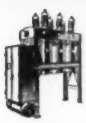
These FZO-151 circuit breakers are equipped with the reliable mechanically trip-free pneumatic operator. The *Ruptor* interrupting device and many other important features also contribute to your assurance of positive operation. The FZO-151 is rated 69 kv up to 3,500,000 kva with 8 to 5 cycle opening, 20 cycle reclosing.

Ruptor and *Unitop* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

MECHANICALLY TRIP-FREE PNEUMATIC OPERATOR IS STANDARD EQUIPMENT ON ALL THESE ALLIS-CHALMERS OUTDOOR POWER OIL CIRCUIT BREAKERS



Type FZO-150 *Unitop* 14.4 to 46 kv, 8-cycle opening, 20-cycle reclosing*

Type FZO-151 . . . 69 kv, 5 or 8-cycle opening, 20-cycle reclosing*

Type BZO-160 . . . 69 kv, 8-cycle opening, 115 to 230 kv — 3 or 5-cycle opening with 20-cycle reclosing*

*20-cycle reclosing standard for 600 and 1200 amp breakers

NOW... practical, low-cost demand metering of even small kw loads!

SINGLE OR POLYPHASE CIRCUITS

To help you achieve all-important economy in the metering of kw demand, Westinghouse continues to develop and improve devices for every application in this field. The result is . . .

A complete line of kw demand type equipment . . . one that fulfills all of your present needs and anticipates many of your future requirements!

The improved CSH single-phase meter and the new CSH-8 polyphase unit (illustrated here) are typical examples of the way Westinghouse pioneers to produce savings for you. Into the CSH meter have gone many new improvements to make it easier, and more practical for you to measure demand on single-phase loads. And the new CSH-8 is the first thermal demand unit available in a socket base for polyphase circuits. Both units combine standard watthour meters with practical thermal demand meters—in a single case—to answer your need for low first cost . . . lower installation and maintenance costs.

In the complete line of Westinghouse metering equipment you'll spot many opportunities for savings. So whether your needs involve large loads or small, single or polyphase circuits, kw or kva, call on Westinghouse.

For complete information on CSH Meters write for Catalog Sections 42-337 and 42-338. Address: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-40394

YOU CAN BE SURE... IF IT'S Westinghouse

METERS

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

NEW!

Type CSH-8 socket-type, combination watthour and thermal watt demand meter for polyphase circuits.

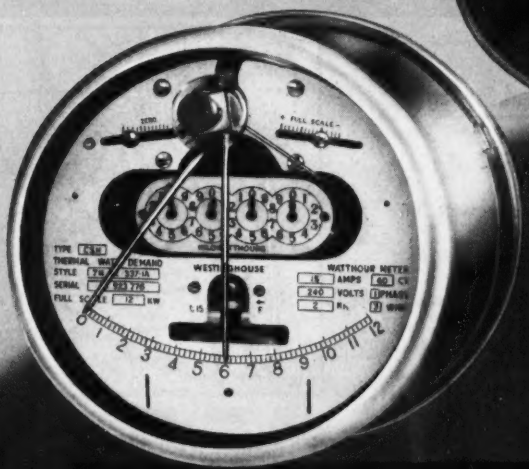
SIMPLIFIED INSTALLATION One mounting for both watthour and thermal demand meter.

LOW MAINTENANCE Simple thermal action provides same low-maintenance characteristics as standard watthour meters.

MINIMUM SIZE Over-all dimensions are the same as for a three-element watthour meter except for the increased depth of the demand-type cover.

IMPROVED!

Type CSH combination watthour and thermal demand meter for single-phase circuits. Now available —high-capacity, 50-ampere, 240-volt, 48-kw demand.



THERE'S A WESTINGHOUSE METER FOR EVERY APPLICATION!

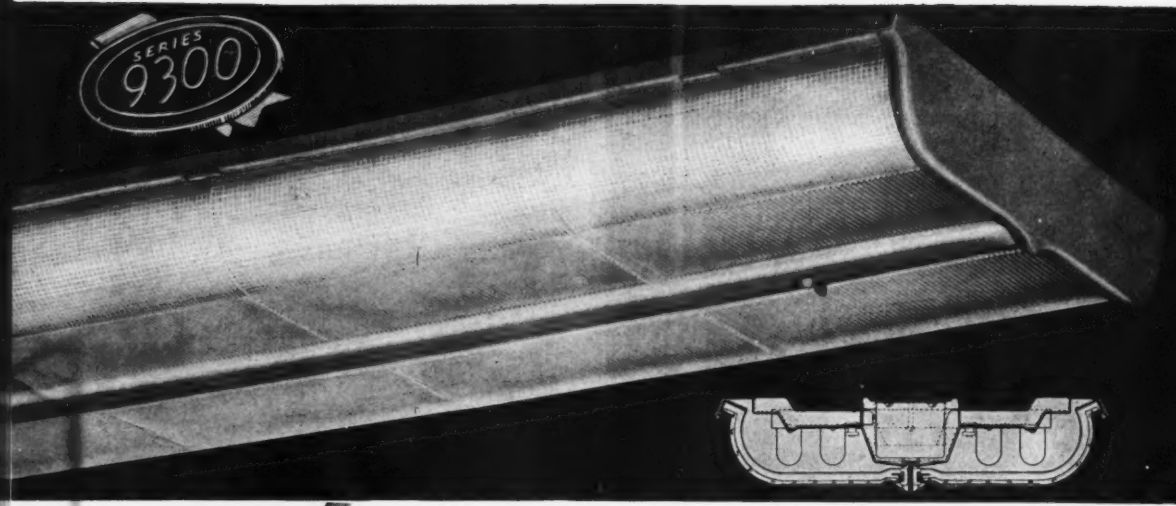
Recording kilowatt demand meters.

Block interval, indicating and accumulative demand registers.

Single or polyphase combination watthour and thermal watt demand meters.

Switchboard-type combination thermal watt demand meters.

IT'S HERE! NEW HOLOPHANE Lighting Series..Introducing HIGH EFFICIENCY with MAXIMUM VISUAL COMFORT



Low Brightness

High Output

Easy Installation

Dramatic New Styling

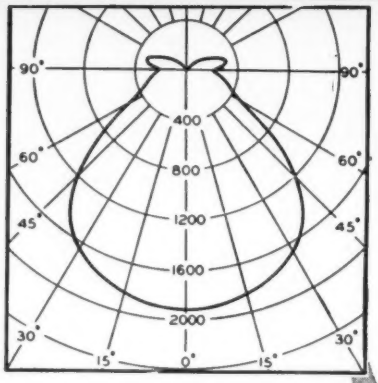
Continuous Installation

Bipin or Single Pin

Minimum Depreciation

Streamlined Styling

The shallow depth of the 9300 Series simulates the modern overall appearance of recessed units without the expense of roughing-in . . .



The newest, important Holophane contribution to lighting advancement is the 9300 Series of Surface-Attached HOLOFLUX* Units, result of long research and development . . . Their enclosed prismatic construction assures the greatest light output for fluorescent lamps with complete absence of cumulative glare, even in long, continuous runs . . . Because HOLOFLUX Units are applicable to such a wide variety of lamp arrangements, the best level of illumination is attainable for any specific interior. The prismatic glass panels are not subject to permanent depreciation; are easy to keep clean . . . The 9300 Series is recommended for commercial and institutional buildings . . . offices, classrooms, drafting rooms, stores, schools, banks and libraries. Architects and engineers are invited to submit plans for lighting recommendations by Holophane engineers.

Write for New 9300 Series Folder today.

HOLOPHANE COMPANY, INC.

Lighting Authorities Since 1898 • 342 MADISON AVENUE, NEW YORK 17, N.Y.

THE HOLOPHANE COMPANY, LTD., THE QUEENSWAY, TORONTO 14, ONTARIO

*Reg. U. S. Pat. Off.

Hotpoint Offers Utilities a Plan of Action Geared to the Problem of Load-Building and Load-Balancing During a Guns and Butter Economy

Because our national economy has taken on an entirely new complexion, the electrical industry is now faced with the problem of operating successfully under a dual economy. This new set of conditions calls for a re-appraisal of what we've been doing and a new look at what needs to be done today.

In the light of present complex conditions, Hotpoint has prepared a suggested long-range utility promotion program timed for introduction during the period of Defense Mobilization—a subject both interesting and appropriate.

This timely program **is designed for presentation in chart form to Utility Management.**

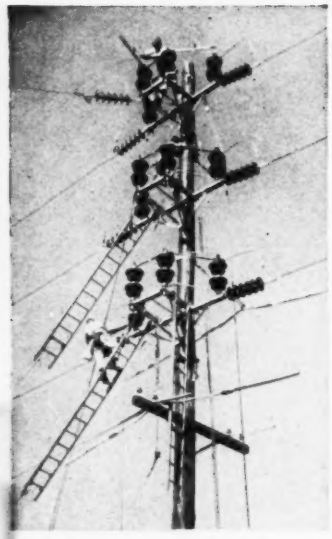
UTILITY DIVISION

Hotpoint Inc.

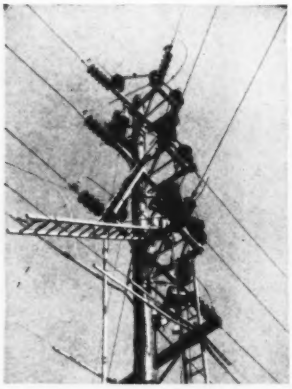
(A General Electric Affiliate)

5600 West Taylor Street, Chicago 44, Illinois

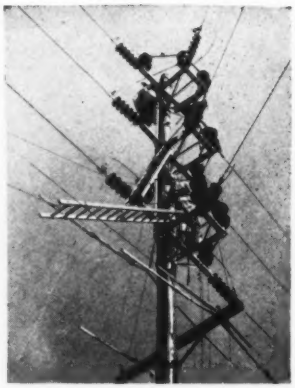
FASTER...MORE ECONOMICAL INSTALLATION with MATTHEWS GOABS!



1. Connecting top and bottom phases of tap.



2. Hoisting left operating pipe. Underbuild is 4160 volts and telephone circuit.

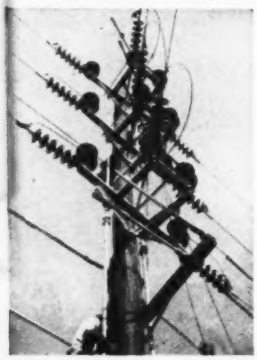


3. Attaching left operating pipe to top phase.

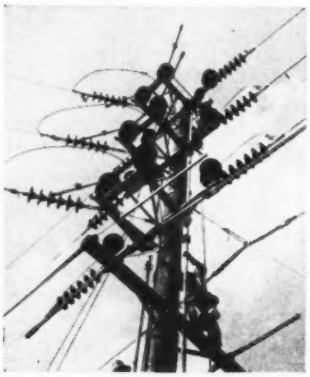
These photos show the progressive steps and complete installation of a Catalog 69KV600 MATTHEWS GOABS—installed February 18, 1951 by the Georgia Power and Light Company on the tap pole serving the Colquitt County R. E. C. at Troupeville, near Valdosta, Georgia. A crew, consisting of three linemen, a foreman and truck driver, began work at 8:30 a. m. The installation was completed by 4:30 p. m. The under-build of 4,160 volts and telephone circuit were worked hot during installation.

The company purchased its first Catalog 69KV600 MATTHEWS GOABS in June 1949. Since then, it has purchased three additional units of the same rating—as further indication of complete satisfaction.

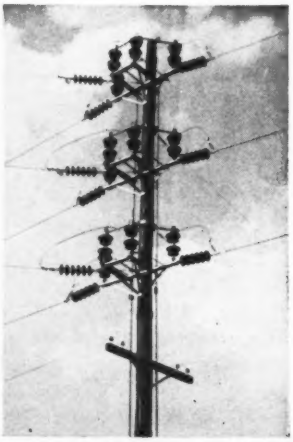
MATTHEWS GOABS not only save in erection costs (approximately $1,000.00 on a 69KV rating), but reduce the need for such critical materials as steel, copper, insulators and wood poles.



4. Both operating pipes in place. Installing guide for left operating pipe. Left switch blades open.



5. Testing and adjusting both switch blades open.



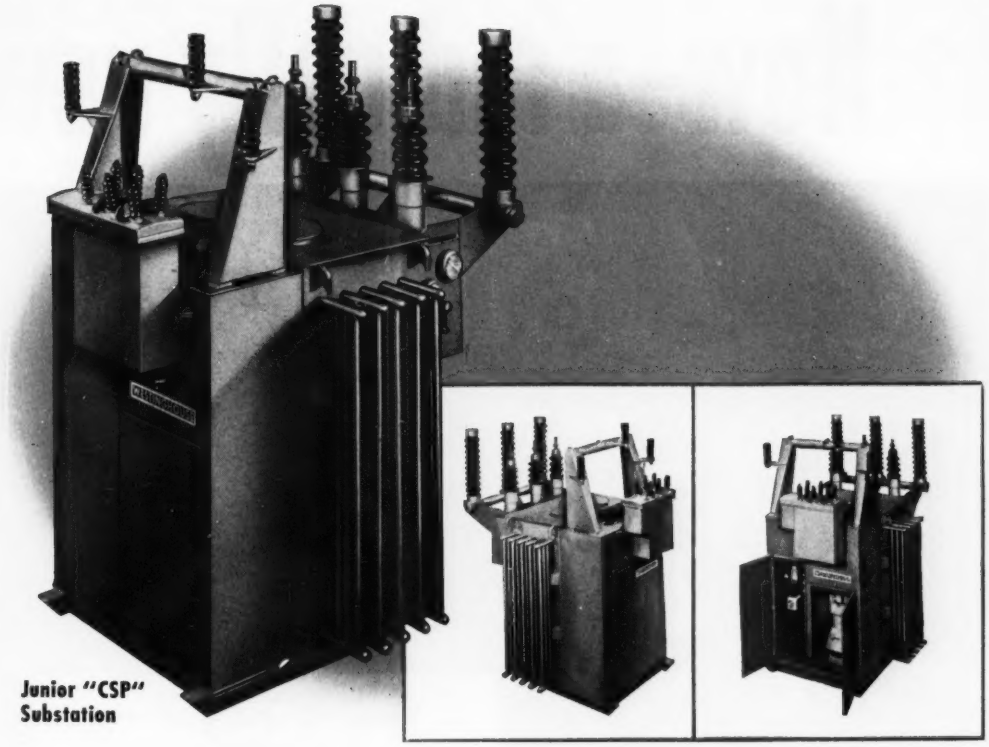
6. Completed installation.

Write for Bulletin 601

W. N. MATTHEWS CORPORATION

3848 DELOR STREET ST LOUIS, MO

ENGINEERS and MANUFACTURERS SINCE 1899



Junior "CSP" Substation

Greater Flexibility...Simplified Maintenance for SMALL CAPACITY FEEDERS

It's easy to move . . . easy to tie in. That's the new Junior "CSP" Substation, designed to give the flexibility needed for changing and growing loads. Completely enclosed construction gives all-weather protection. All parts are easily accessible . . . maintenance can be handled quickly and easily at ground level. In fact, the Junior "CSP" Substation gives every advantage of unit equipment . . . for *small* substation use.

The Junior "CSP" Substation is ideal for small towns . . . rural lines . . . and industrial plants where capacity of feeder does not justify a higher rating. It's a new design based on principles proved through years of dependable service with large "CSP" Substations. The Junior "CSP" (Completely Self-Protecting) Substation has both thermal and lightning protection built in. And it's completely factory-assembled with integral high and low-voltage switchgear, and metering equipment.

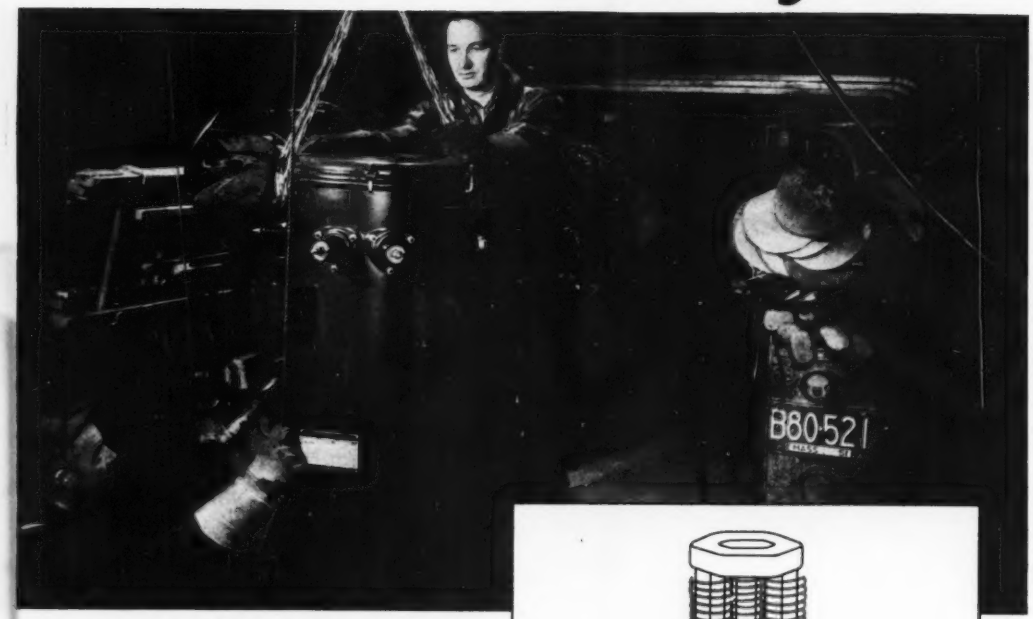
Available in ratings from 300 to 1,000 kva; others to 3,000 kva. For more information call your nearest Westinghouse representative, or write for Booklet B-4692, Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-70584

YOU CAN BE SURE... IF IT'S Westinghouse

JUNIOR "CSP" POWER TRANSFORMER

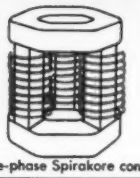
Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

Now-a radically new

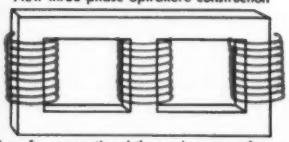


New three-phase Spirakore distribution transformers are easier to handle. The 45-kva unit is 400 pounds lighter than conventional designs, and takes 21 % less platform space. Its height is 17 inches less than the vertical or "stacker" type.

This is a typical core of General Electric's new Spirakore three-phase distribution transformer. The core steel is "corosil"—cold-rolled silicon strip with the grain structure of the steel oriented with the flux path.

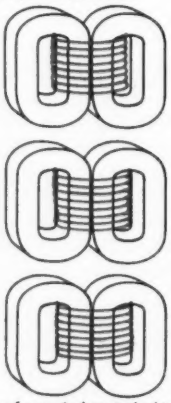


New three-phase Spirakore construction



Core for conventional three-phase transformer

The line sketches above and to the right show the relative proportions of the Spirakore core compared with the core used in the conventional horizontal three-phase transformer and with that used in the vertical or "stacker" type.



Core for vertical or stacked-type three-phase unit

SPIRAKORE three-phase distribution transformer

Revolutionary General Electric design cuts weight 25% over conventional units

New transformer uses cold-rolled oriented steel in wound-core construction for the first time in a three-phase core. Improvements include smaller dimensions, easier handling, and lower exciting current. This transformer is suitable for *either* pole or floor mounting.

General Electric is now building three-phase distribution transformers up to 150-kva, 15,000 volts and below, with Spirakore construction. This is the result of intensive research—another advancement by the company that first introduced wound-core construction to distribution transformers in 1937.

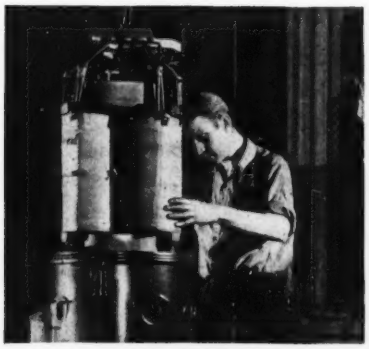
These new three-phase transformers have lighter weight, smaller dimensions and lower exciting current.

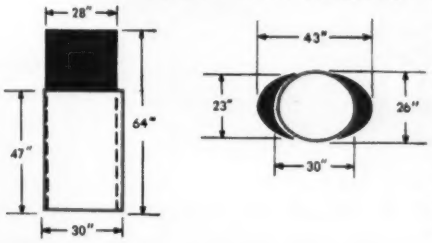
All the other improvements that have characterized Spirakore are incorporated—high mechanical strength, excellent impulse strength, completely sealed tanks, and superior Melaglyp† paint that is 50% better in resistance to weathering and moisture absorption.

For full information on these transformers, contact your nearest G.E. Apparatus Sales Office, or write *General Electric Company, Schenectady 5, New York.*

** Reg. Trademark of General Electric Company.*
† A new, greatly improved G-E paint made with melamine-modified Glyptal (registered trademark of the General Electric Company for alkyd resin).

Here the core-and-coils of a 30-kva Spirakore three-phase transformer are being lowered into the tank.





These two diagrams compare the height of the new three-phase transformer, in red, with that of a vertical or "stacker" three-phase unit, in black—and the floor area with that of a conventional or horizontal three-phase transformer. In both cases transformers are rated 45 kva.

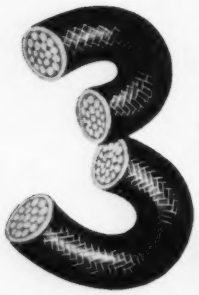
THREE-PHASE SPIRAKORE TRANSFORMERS 9-150 KVA, 5000 VOLTS AND BELOW

	9 Kva	15 Kva	30 Kva	45 Kva	75 Kva	112½ Kva	150 Kva
Net Wt Inc. Liquid	390	510	900	1000	1400	2100	2450
Height	29	39	47	47	57	63	70
Floor Space	24x23	24x23	28x26	30x26	33x29	36x34	36x34
Liquid (gal)	16½	20	39	37	62	87	92

GENERAL ELECTRIC

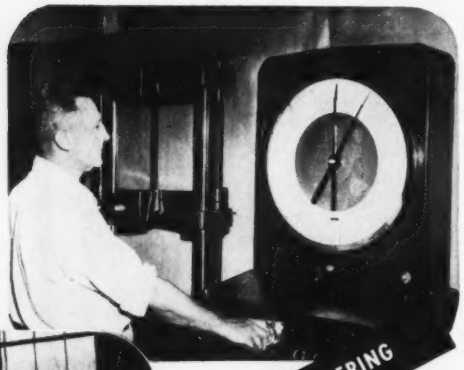
402-107

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

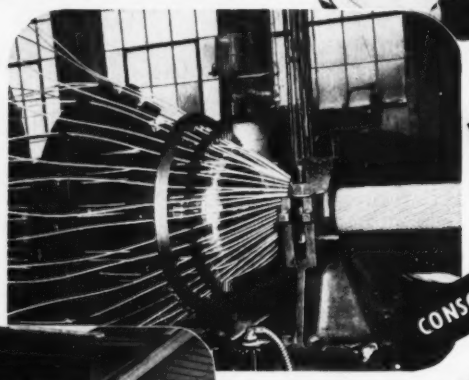


3 way protection

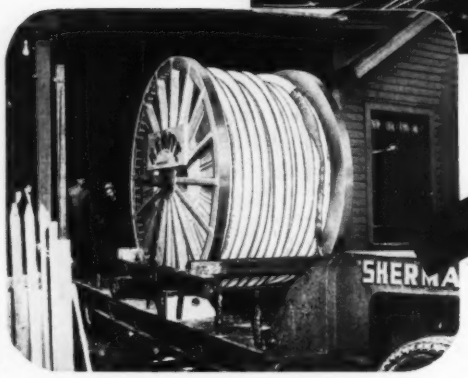
insures the long-life inherent in Kerite Cable



FINE ENGINEERING



CONSCIENTIOUS WORKMANSHIP



CAREFUL HANDLING

Kerite's 3-way protection of *quality*—through the finest possible engineering, workmanship, and handling—insures you a 3-way service benefit—the safety, reliability, and economy that are inherent in the insulation itself.

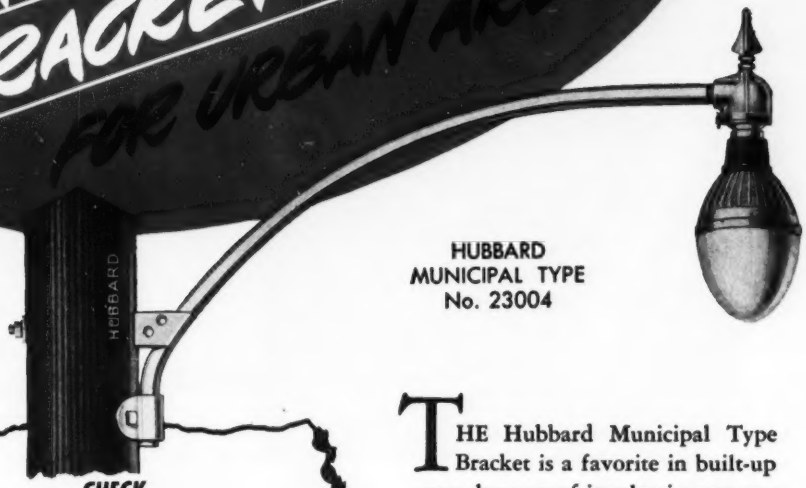
Whether it's a special cable or one for the standardized circuits of power-plant and signaling operation, Kerite welcomes the opportunity to consider your requirements in the light of nearly a century's experience applying the exclusive Kerite formula to vital cable services.

THE KERITE COMPANY, 30 Church Street, New York 7, N. Y. Offices also at 122 Michigan Avenue, Chicago; 582 Market Street, San Francisco; 3901 San Fernando Road, Glendale 4, Calif.

KERITE CABLE

Kerite Insulation—Your Cable's Best Life Insurance

THE MOST POPULAR BRACKET DESIGN FOR URBAN AREAS



HUBBARD
MUNICIPAL TYPE
No. 23004

CHECK
THESE ADVANTAGES

- ✓ All welded construction throughout
- ✓ Requires small pole mounting space
- ✓ Meets all current strength and design requirements
- ✓ "Keyhole," basic feature of pole attachment, permits installation by one man
- ✓ Simplicity of design means low cost
- ✓ Permanently aligned at factory
- ✓ "Free flowing" internal wiring—no sharp bends and no obstructions—wiring pushes through with a minimum of resistance

THE Hubbard Municipal Type Bracket is a favorite in built-up areas because of its pleasing appearance and adaptability. The bracket is internally wired and adaptable to either internally or externally wired systems. It may be installed close to the top of the pole for maximum elevation. It is easily installed by one man, comes in nominal lengths of 3, 4, 5, and 6 feet, with rises from 16 to 26 inches.

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ESTABLISHED 1843
PITTSBURGH • CHICAGO • OAKLAND, CALIFORNIA
"Hang the Load on Hubbard Hardware!"

You can't buy Better Fittings or ones that cost less to use

Cross Section Showing Indentations.

Quicker to use and neater in appearance, Briegel All-Steel Indenter Fittings not only make stronger connections but also make each job more profitable to the contractor and satisfactory to his customers.

Two Easy Squeezes and they're set to stay. It is only natural that the Briegel All-Steel Indenter Fittings are the most widely used E.M.T. connectors and couplings. Contractors the world over recognize their cost cutting qualities and the fact that they make each wiring job neater, stronger and better.

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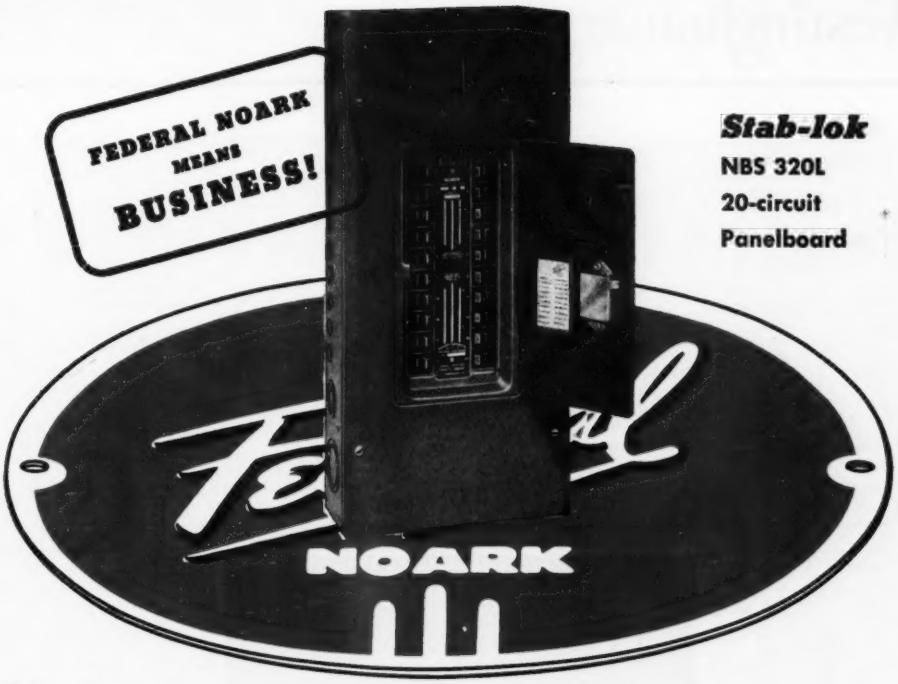


Stab-lok
NBS 320L
20-circuit
Panelboard

Make more money with Stab-lok

Registration Applied For

CLINCH more and more business! Give your customers today's safest, most convenient circuit protection at amazingly low cost . . . with the Federal Noark STAB-LOK system!

Here's how it works. You get the necessary STAB-LOK components from your authorized Federal wholesaler. All you need is the right-size STAB-LOK enclosure and STAB-LOK Circuit Breakers of the required ratings. Simply plug in the self-locking breakers and the unit's complete for installation in a matter of seconds.

There are nine STAB-LOK enclosures, with capacities of from 1 to 20 circuits. Most of them are the Noark "combination" type for either flush or surface mounting. All suitable for service equipment have an insulated groundable neutral. STAB-LOK Circuit Breakers come in a standard calibrated range of from 15 to 50 amperages, single or double pole.

Start cashing in today with the STAB-LOK System. The huge circuit protection field is wide open for this modern, profitable development. Write for the whole STAB-LOK story. Federal Electric Products Company, 50 Paris Street, Newark 5, New Jersey.

Stab-lok OUTMODES ALL POPULAR FUSIBLE EQUIPMENT UP TO 60 AMPS.

To insert STAB-LOK Breaker, simply put end under hook and push into place. Stabs make instant contact and are locked in place without screws.

Single pole STAB-LOK with micromatically calibrated metal heart. Only one solderless terminal... resets automatically.

STAB-LOK line includes raintight devices, handle extensions, handle ties and adapter frames for easy flush mounting.

STAB-LOK "Flush-Surface" Enclosures are delivered with picture-type frame in place and ready for surface mounting. For flush mounting, discard frame.

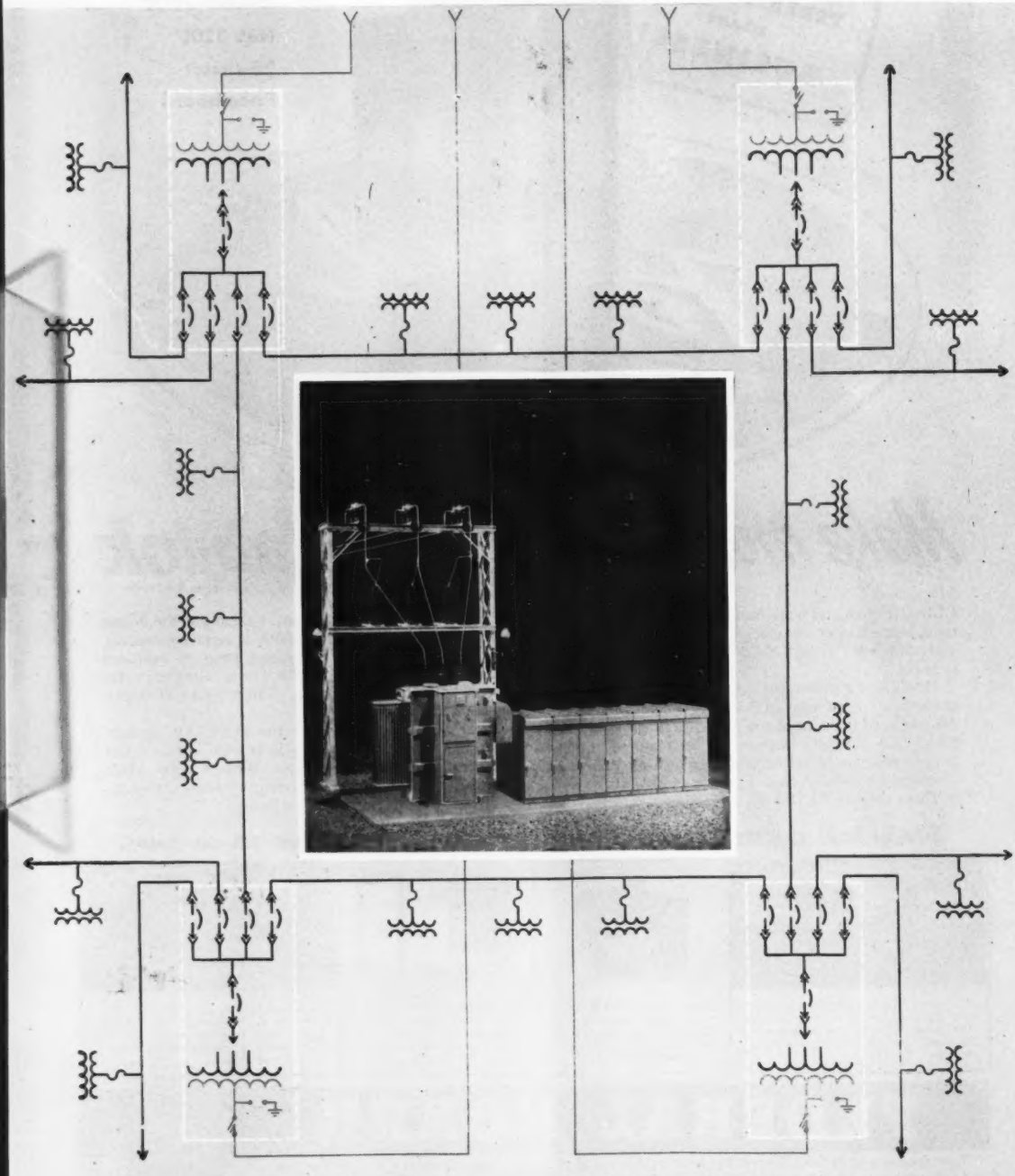
FEDERAL NOARK

Federal NOARK

Complete line of Federal Electric Products includes Motor Controls, Safety Switches, Service Equipment, Circuit Breakers, Panelboards, Switchboards, Control Centers, Bus Duct ★ Sales offices in principal cities.

YOU CAN BE **SURE**.. IF IT'S

Westinghouse



Co-ordinated Substation of the Primary Network type energized from a single subtransmission circuit.

CO-ORDINATED SUBSTATIONS

Help Simplify Systems *and* Lower Power Distribution Costs

The substations you choose *now* will become vital tools in building simplified systems . . . *and* lowering power distribution costs; therefore, *their inherent design must provide for these factors.*

The Westinghouse Co-ordinated Substation, shown here, is one example. It is a compact standardized unit designed to economically answer Primary Network requirements. It is completely co-ordinated from incoming line facilities to outgoing feeders.

This relatively small, bus-regulated substation, and its associated system, economically simplify many distribution problems. Individual feeder regulation is eliminated. Fewer high-voltage breakers are required. The cost of switching on the subtransmission side of the station is reduced. Unitized construction provides flexibility for meeting future load requirements. Transformers and breakers can be quickly de-energized for maintenance . . . without service interruption.

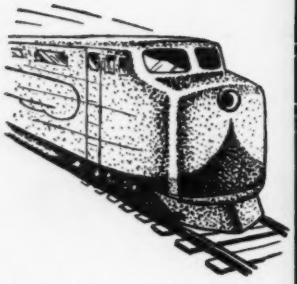
As you plan for the future and gradually simplify your system, be sure you have considered the benefits of Westinghouse Co-ordinated Substations. Their part in long-range power distribution economies has been carefully considered in every phase of their design and construction. More information is given in Booklet B-4061. Ask your Westinghouse representative or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60729-A

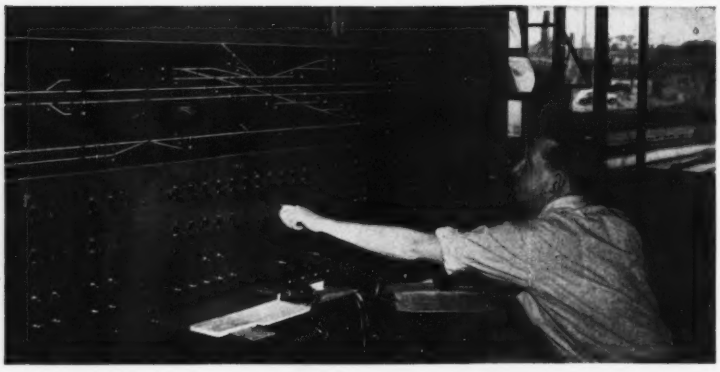
Westinghouse

COORDINATED SUBSTATIONS

WESTINGHOUSE

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.





REACHING OUT 20 MILES TO LEAD A TRAIN

Railroad signal and communication engineers require dependability above all other things in the equipment which they buy. When it comes to signal cables, which are the vital connecting links between control machines and signals, they have a serious problem. If the cables are installed in the air they are subject to cinders, sparks, heat, sunlight, sleet and rain. If they are installed underground, the cables must be able to withstand long-time exposure to water, soil acids and alkalies, vibration from passing trains, and the cutting effect of sharp cinders. This is brutal punishment. So how to get trains through safely and on time — not once, but every day in the year?

Fortunately, long before the railroads started to use CTC (Centralized Traffic Control) Simplex had developed an insulation that had excellent properties for signal and communication work and was dependably water resistant. That solved the moisture problem. The use of especially compounded neoprene as a jacketing material solved the problem of how to combat sparks, heat, sunlight, rain, etc. This is a typical example of how Simplex Research helps to provide just the right cable for the job.

Simplex Research gave you the first heavy duty, rubber-jacketed portable cord or cable; the first low water absorption insulation; the first rubber-jacketed underground cable. Besides these notable "Firsts" Simplex Research has provided a great many developments which have enriched the art of cable design.

SIMPLEX-ANHYDREX IS A PRODUCT OF SIMPLEX RESEARCH

SIMPLEX-ANHYDREX

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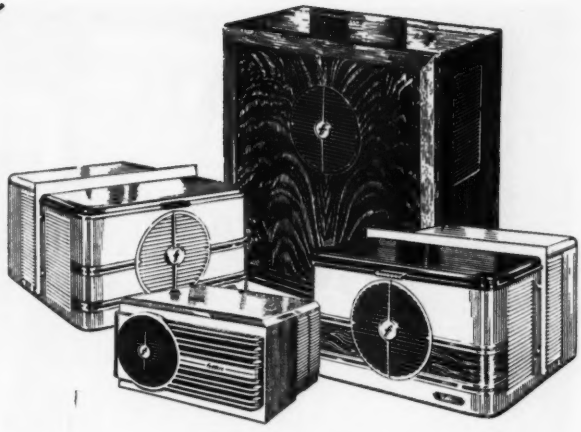
FEDDERS BUILDS YOU A PROFIT MACHINE



With the hardest-working, fastest-selling line in the Air Conditioning industry!

Fedders full line offers attractively styled models to fit every air conditioning need! Each model packed with features you can sell, demonstrate and use to close sales faster. Fedders new ⅓ ton model opens vast new markets for the alert dealer. Exclusive consumer benefit features and compact styling mean you spend less time and get more profit per Fedders Room Air Conditioner sale!

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Mail this coupon now for facts on Fedders 2 completely worked out profit-making plans

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Gentlemen: Please send me complete information on how I can make extra profit selling the 1951 line of Fedders Room Air Conditioners.

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NATVAR IN BRAZIL

Stators, insulated with Natvar slot cell insulation and varnished cambric tapes, on racks ready for infra-red baking operation.

A corner of the Test Department at Arno, S.A., of Sao Paulo.

This exploded view shows the simple yet rugged construction typical of Arno motors. The motor shown is 1½ hp., three-phase, drip-proof.

Arno, S.A. of Sao Paulo, Brazil, the leading manufacturer of electrical equipment in Brazil, produces most of the motors, and associated power equipment used in South America's largest country.

Like the manufacturers of similar products in North America, Arno realizes the importance of quality electrical insulating materials for unfailing service in the field. It is for this reason they have selected Natvar products for their insulation requirements. Arno motors depend upon Natvar slot cell insulation, varnished cambric tapes.

All Natvar electrical insulating materials are recognized for their high standards of quality and uniformity throughout the world.

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- Silicone coated Fiberglas
- Varnished papers
- Slot insulation
- Varnished tubings and sleevings
- Varnished identification markers
- Lacquered tubings and sleevings
- Extruded vinyl tubing and tape
- Extruded vinyl identification markers

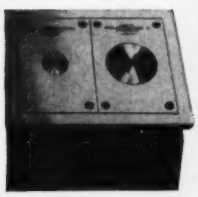
Ask for Catalog No. 21

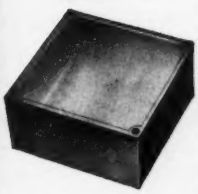
It may be true that
Too many cooks spoil the broth
but it is just as true that
A cook can have too many broths on the fire

The latter reasoning has been used by Steel City for almost fifty years.

Steel City SPECIALIZES in electrical boxes, covers and conduit fittings and each item is carefully designed for the purpose for which it is intended and reduce installation time.

that is why - in these lines . . .





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STEEL CITY ELECTRIC COMPANY

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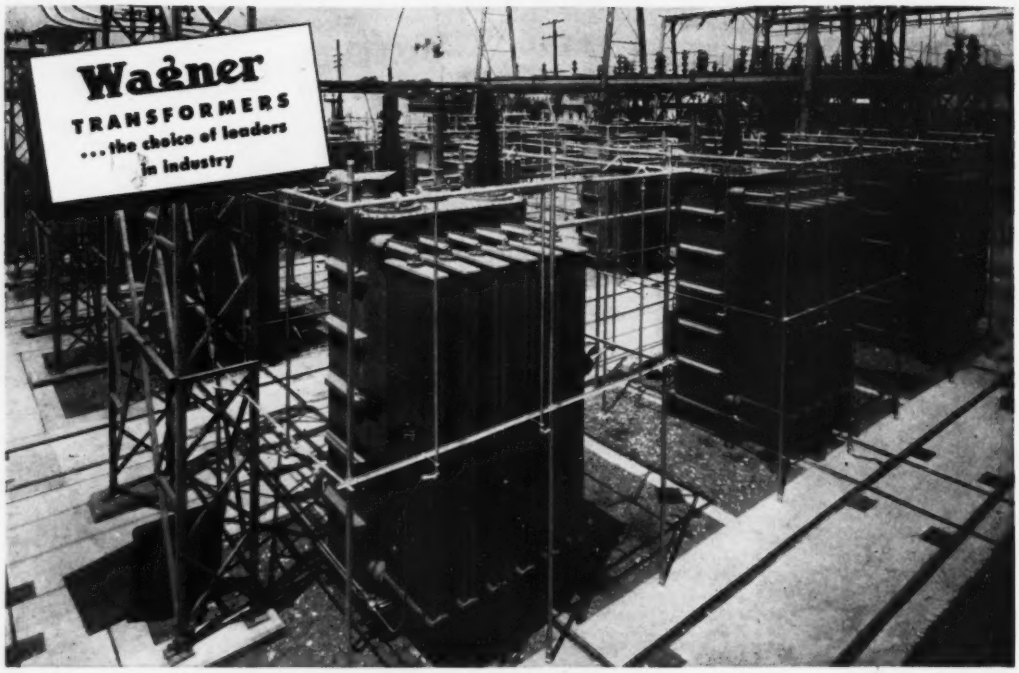


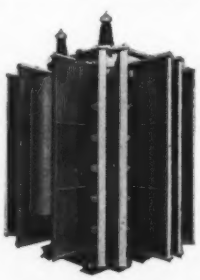
Wagner Transformers provide New Orleans Public Service dependable distribution of power for tomorrow

The new Midtown Substation of New Orleans Public Service, Incorporated, helps assure a plentiful supply of vital electricity for the steadily increasing needs of New Orleans and its rapidly-expanding industrial area.

The ten oil-filled Wagner Power Transformers used in this substation are each rated 5000 kva self-cooled, 6667 kva forced-air-cooled, 115,000 volts Delta to 13,800 volts Y, with full capacity taps at 110,000, 104,500, and 99,000 volts, and reduced capacity tap at 93,500 volts.

Wagner transformers are an important part of the equipment of many power companies because they have a reputation for unfailing dependability established through sixty years of service to the power industry. The complete story is told in Bulletin TU-181—you should have a copy.

Call the nearest of our 31 branch offices for competent advice on your next transformer installation.



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1891 1951

TU-11

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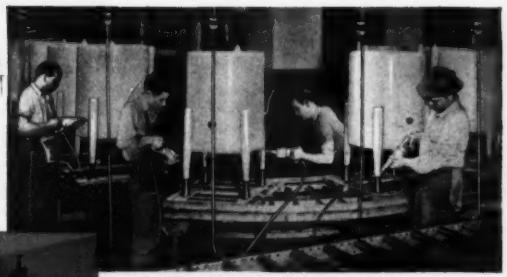
ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS – AIR AND HYDRAULIC

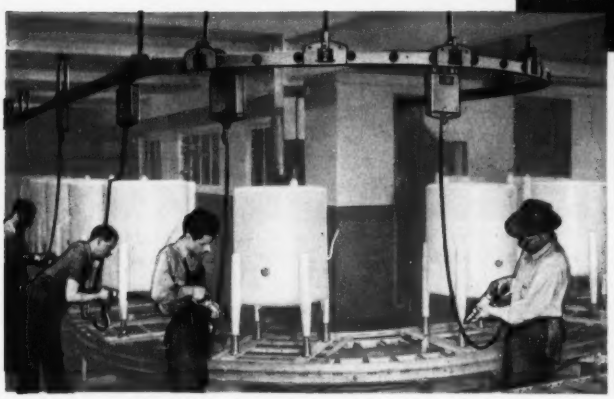
BRANCHES IN 31 PRINCIPAL CITIES

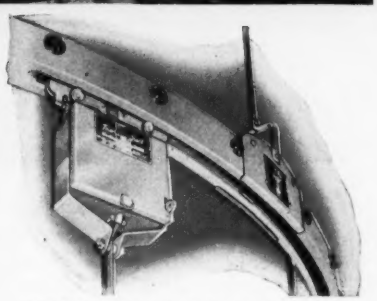
Appliance manufacturer steps up production with *mobile power system*

BEFORE—Long, entangling extension cords from old-fashioned, stationary outlets wasted valuable time, jeopardized workers' safety.

AFTER—Trolleys move with the job, transmitting "on-the-spot" power. Some manufacturers report BullDog Industrial Trol-E-Duct saves as much as 30 minutes per man per shift.







Put this slot to work for you! It's the only answer to profitable power for modern assembly lines.

BullDog Industrial Trol-E-Duct can save you up to 30 minutes per man per shift!

PUT EXTRA profit in your production line with flexible, efficient BullDog Industrial Trol-E-Duct.

This revolutionary system carries current by copper bus bars encased in insulated steel duct. Trolleys, pulled along the continuous slot in the bottom of the duct, transmit power from bus bars to portable electrical tools, cranes, hoists and other moving "loads."

Awkward extension cords are eliminated. An eight-ounce pull moves power with the job. Workers can tap off power at any point along an Industrial Trol-E-Duct run.

And this modern system is just as flexible in meeting installation changes as it is in use. Every inch of Industrial Trol-E-Duct is salvable and can be quickly dismantled and reinstalled when it's time to move.

Yes, you can solve many a production headache with "on-the-spot" power. Your local BullDog Field Engineer will be glad to show you an Industrial Trol-E-Duct installation near your own plant any time.

BULLDOG ELECTRIC PRODUCTS COMPANY
DETROIT 32, MICHIGAN • FIELD OFFICES IN ALL PRINCIPAL CITIES
IN CANADA: BULLDOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO

BULLDOG

PIONEERS IN FLEXIBLE ELECTRICAL DISTRIBUTION SYSTEMS

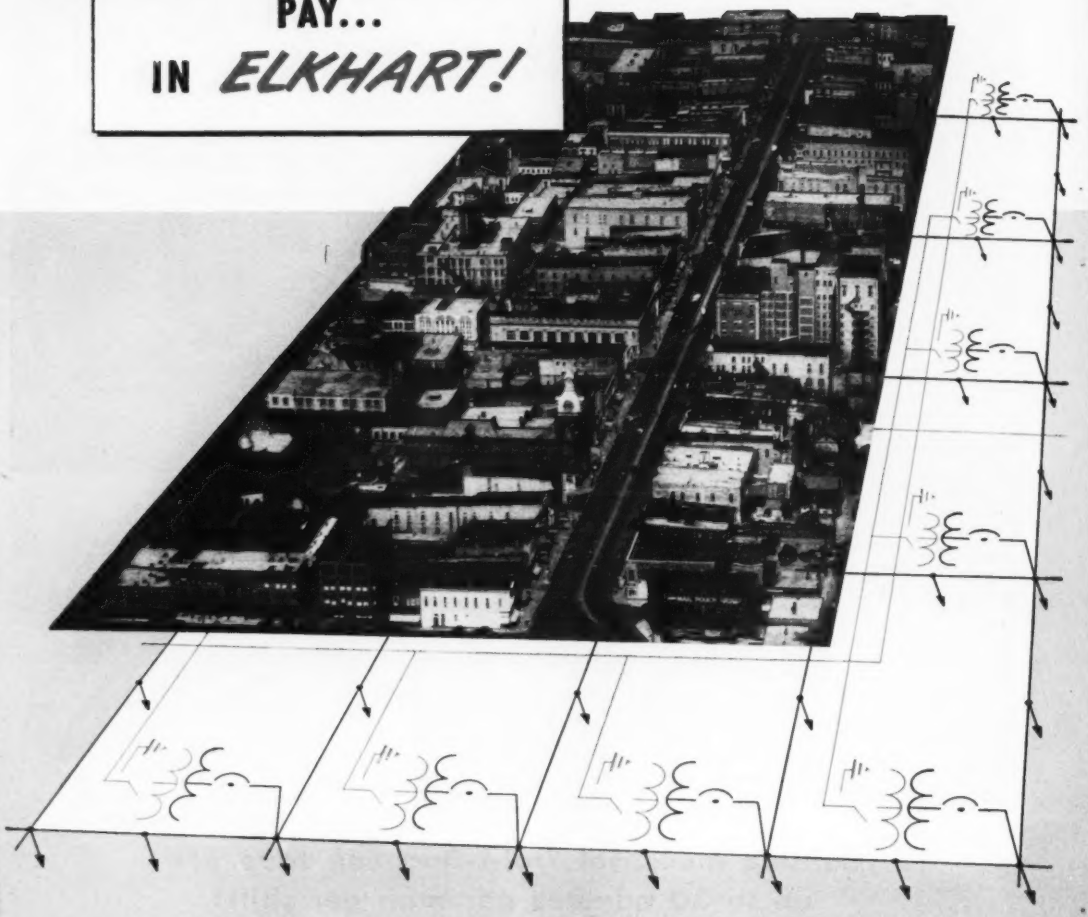
CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES

Coast Electric & Manufacturing Co.
1720 N.E. Sixth Avenue Tel. Tuxedo 5191
Portland 12, Oregon

Safety Switchboard Company
1445 Stevenson Street Tel. Hemlock 1-2470
San Francisco 3, Calif.

Paul L. Mullenbach Co.
3008 E. Olympic Blvd. Tel. Angelus 9-8101
Los Angeles 23, Calif.

NETWORK SYSTEMS PAY... IN *ELKHART!*

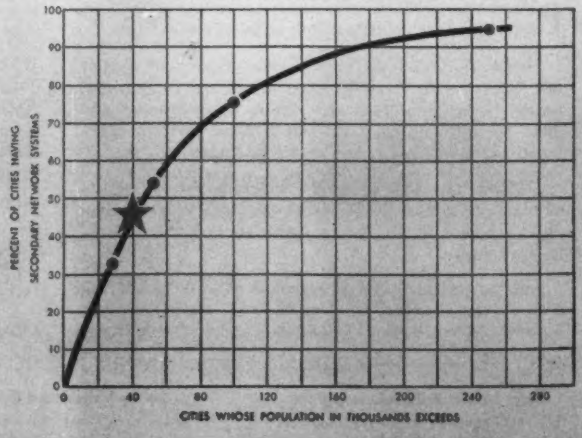


FACTS ABOUT ELKHART'S A-C SECONDARY NETWORK SYSTEM.

The secondary network system is supplied from 13 vaults having a total capacity of 3,900 kva. The area covered by Elkhart's network is almost 20 square blocks, containing 3.61 miles of conduit, 5.47 miles of primaries and 2.27 miles of secondary feeders.

One third of all cities in the United States with a population of 25,000 or more have network systems, while one half of all cities with a population of 50,000 or more have network systems.

USE OF A-C SECONDARY NETWORK SYSTEMS IN VARIOUS SIZE CITIES



17 years' uninterrupted service... no voltage-regulation problems

There's no power service problem in the business district of this bustling Indiana town of 40,000 . . . they took care of that 17 years ago. Then, Elkhart was struggling with an overloaded radial system, consisting of 3-phase primaries and both 3-phase and single-phase secondaries . . . tranformers were mounted on practically every pole. The Fire Department and fire underwriters were concerned . . . the utility was plagued with voltage-regulation problems.

OVER AND UNDER . . . In 1934 the Indiana and Michigan Electric Company met the problems of Elkhart's business district by installing an *A-C Secondary Network System.* Transformers and primaries were placed underground . . . the secondaries and services overhead. This overhead and underground combination, particularly applicable to smaller cities and towns, made possible great economy in the original installation cost.

IMPROVED SERVICE . . . The A-C Secondary Network System has resulted in a high standard of continuity of service and uniformly good voltage-regulation, not attainable through radial distribution systems. Underground placement of the primaries and transformers has greatly reduced congestion and improved appearance.

ABOUT MAINTENANCE . . . Maintenance story here is typical of all users of secondary networks . . . it's low, almost negligible. The utility reports that in 17 years of operation, there has never been a complete interruption of the system. Underground crews like the convenience of maintaining the system. They know . . . they work with the equipment.

CUSTOMERS AND UTILITIES BENEFIT . . . Utility customers appreciate the high-quality service and uniformly good voltage-regulation afforded by network service. The utility benefits from reduced operating and maintenance expense and improved customer good will. Large or small, your town can have high-quality network service . . . at a cost commensurate with the benefits this service affords. Westinghouse makes this equipment and can help in your planning. Call or write: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

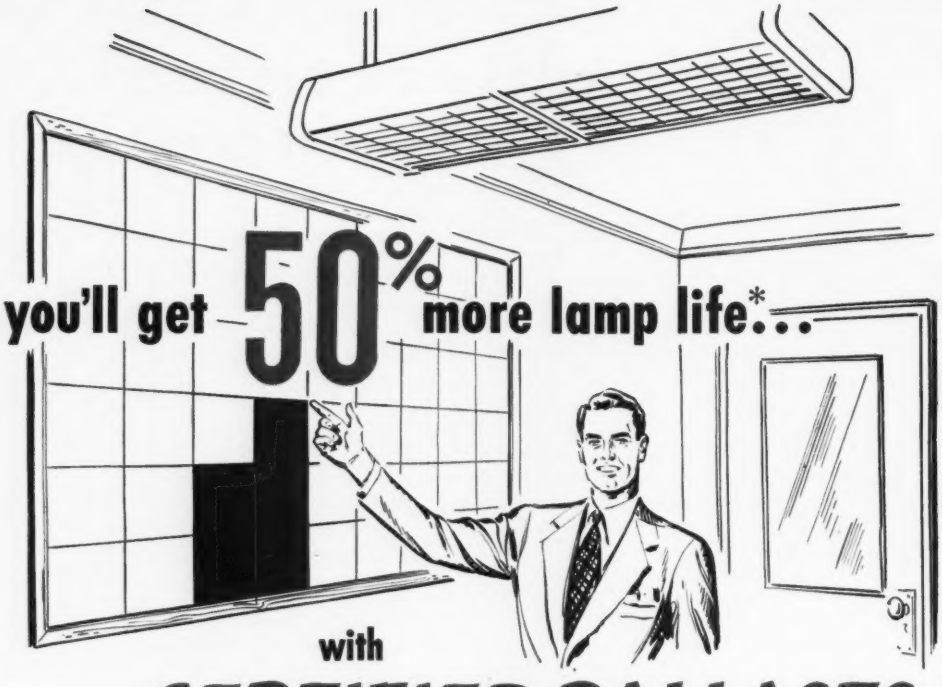
J-97155

YOU CAN BE SURE... IF IT'S Westinghouse

NETWORK EQUIPMENT

WESTINGHOUSE

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.



you'll get 50% more lamp life*...

with CERTIFIED BALLASTS

● Recent experience has shown that fluorescent lamps last 50% longer when powered by CERTIFIED BALLASTS rather than poor quality ballasts that are commercially available.

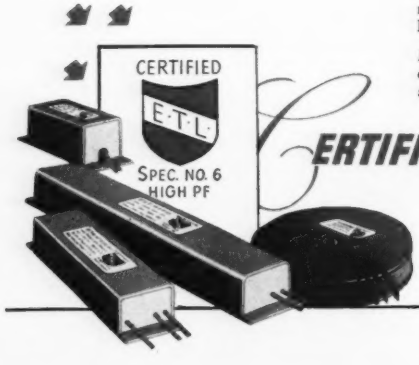
This, together with the fact that CERTIFIED BALLASTS assure rated light output and long, satisfactory ballast life makes CERTIFIED BALLASTS a *must* in selecting fluorescent equipment.

CERTIFIED BALLASTS are made to exacting specifications, then tested and checked by Electrical Testing Laboratories, Inc.

*Lead lamps on a two-lamp ballast.

● Complete information on the types of CERTIFIED BALLASTS available from each participating manufacturer may be obtained from Electrical Testing Laboratories, Inc., East End Avenue at 79th Street, New York, New York.

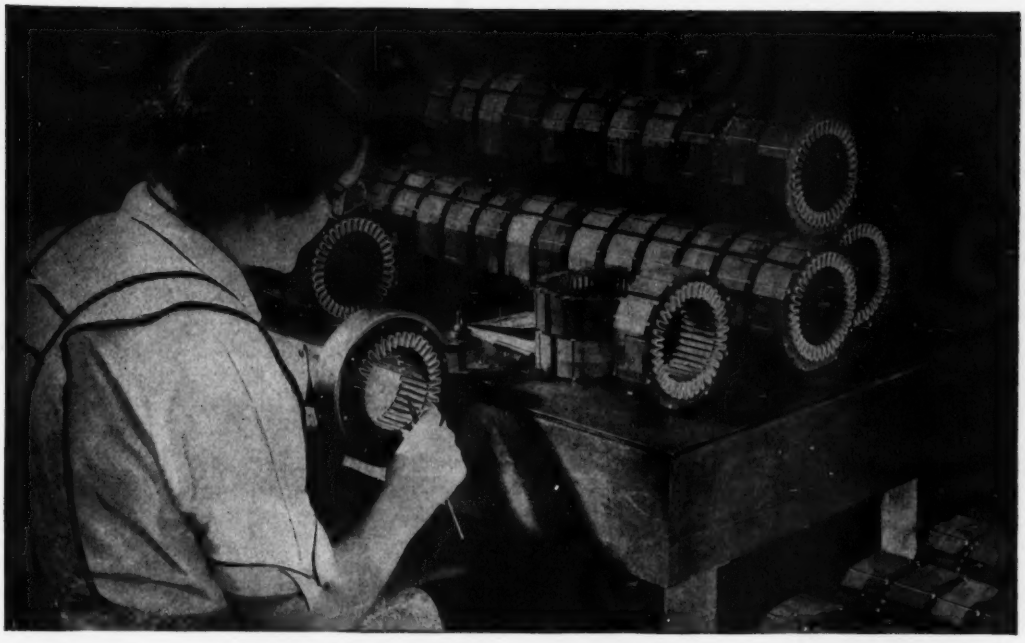
Participation in the CERTIFIED BALLAST program is open to any manufacturer who complies with the requirements of CERTIFIED BALLAST MANUFACTURERS.



CERTIFIED BALLAST MANUFACTURERS

Makers of Certified Ballasts for Fluorescent Lighting

2116 KEITH BLDG., CLEVELAND 15, OHIO



"Motors with IRV-O-SLOT insulation give year after year of service"

The Kingston-Conley Division of the Hoover Company uses Irvington IRV-O-SLOT insulation on its famous line of electric motors. Mr. A. E. Ott, Sales Engineer at Hoover, tells *why:*

"The high quality of the paper backing used in IRV-O-SLOT insulation has been fully proved by the many years over which our motors give satisfactory service. We find, too, that Irvington's slitting facilities give us greater flexibility in selecting paper widths, and allow us to shorten up our scheduling cycles."

These are among the reasons why IRV-O-SLOT has been the choice of many an electrical manufacturer, ever since Irvington introduced it as one of the *first* combined varnished-cambric-and-backing slot insulations.

The IRV-O-SLOT line now includes insulation for every slot requirement. Backing papers combine high dielectric and mechanical strength with ease of forming. Bonding adhesive allows enough "give" to prevent rupture of varnish film. IRV-O-SLOT literature is yours for the asking—just use the coupon below.

Send this convenient coupon now

Irvington
VARNISH & INSULATOR COMPANY
Irvington 11, New Jersey

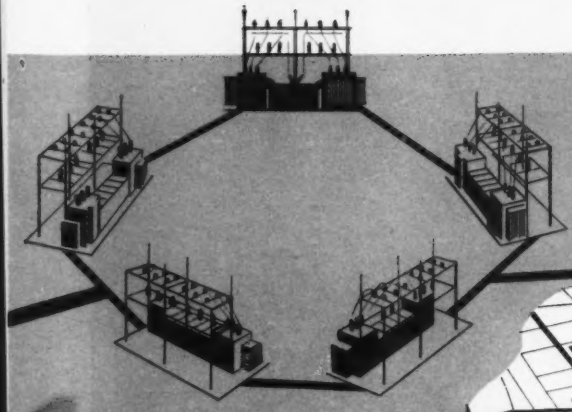
Irvington Varnish & Insulator Company EWe-6/51
6D Argyle Terrace, Irvington 11, N. J.

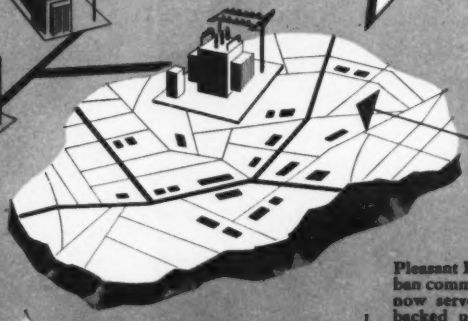
Gentlemen:
Please send me technical literature on IRV-O-SLOT insulation.

Name.....
Company.....
Address.....
City..... State.....

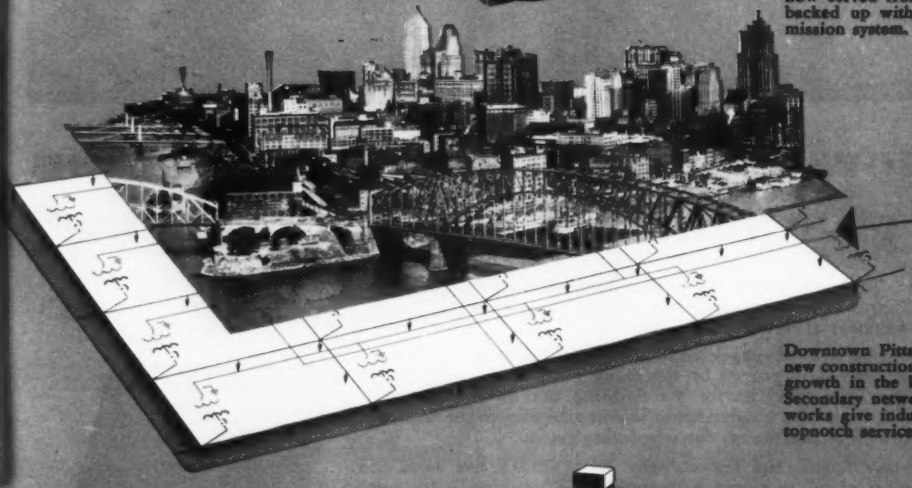
Represented in the Western states by C. D. LaMoree, Los Angeles, Berkeley, Seattle, Portland; Electric Motor Supply Company, Denver.

PERPETUAL SYSTEM PLANNING PAYS... IN *PITTSBURGH*

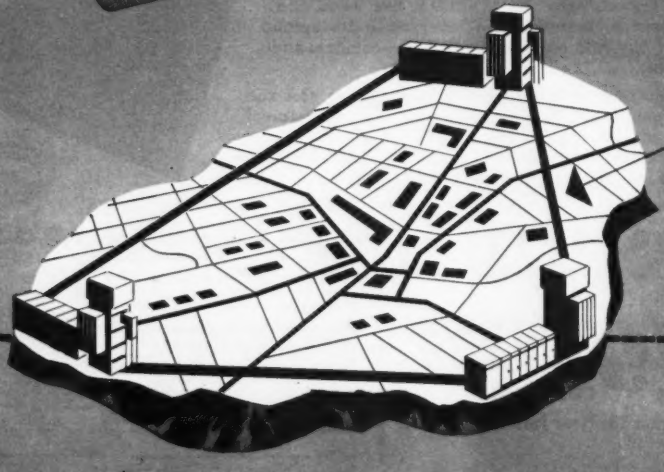




Pleasant Hills . . . a growing suburban community south of Pittsburgh, now served from radial primaries backed up with a loop subtransmission system.



Downtown Pittsburgh . . . there's new construction and constant load growth in the booming Triangle. Secondary networks and spot networks give industry's nerve center topnotch service.



Squirrel Hill . . . a concentrated residential community including a large shopping center. Primary networks backed up with a loop subtransmission system, meet the problems of this medium load-density area.

"Simplified Systems

meet our load growth...
reduce distribution costs"

In Pittsburgh you'll find all the benefits from almost 30 years of sound system planning. Main benefit—complete flexibility to meet all load growth economically.

Duquesne Light Company take full advantage of the latest advances in the design and reliability of modern unitized electrical apparatus. Small blocks of power are integrated to improve their own unique Service Continuity Standards without uprooting the entire system.

CASE I Greatly increased load with subsequent voltage problems necessitated improved service continuity and the elimination of line losses for this suburban area. Proper system planning utilized a nearby subtransmission loop by installing a unit-type single-feeder substation. Pleasant Hills gets adequate service and costly field-erected substations are eliminated.

CASE II Secondary networks have provided Pittsburgh's Triangle with the highest quality of service since 1926. Badly congested primary feeders and small transformer installations were eliminated. Duquesne Light Company also offers the spot network form of the system for large commercial buildings. Sound planning enabled Pittsburgh to grow without any basic changes in the system.

CASE III 4 kv primary networks were installed in 1949 to economically meet the Service Continuity Standards for this medium load-density area. Careful planning based on load growth, income potential and geographic conditions dictated the necessity for a primary network system. Now, service continuity is high and there's complete flexibility to meet any increase or change in load density.

BECAUSE OF SOUND PLANNING, systems have been simplified, small blocks of power integrated, high service standards maintained, power distribution costs reduced. Westinghouse equipment and co-ordinated distribution apparatus have contributed to the ease and speed of change-over, dependability, and economy of this model operation. Use Westinghouse as your planning partner. Call us when you're ready to modernize. Start modern planning now!

J-97154

YOU CAN BE SURE... IF IT'S Westinghouse

SYSTEM PLANNING SERVICE

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

ALL 4 AGREE on NEW APPLETON V-51 SERIES

CONVERTIBLE VAPORTIGHT LIGHTING FIXTURES

Patent Applied For

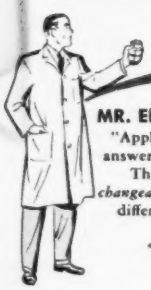
WITH MALLEABLE IRON BODIES

100 WATT OR 150-200 WATT UNITS

MR. PLANT ELECTRICIAN Says: "This V-51 Fixture is a real work-saver! Re-lamping's a cinch. One trip up the ladder to exchange Unit Assemblies and the job's done! Cleans fast, too. I attach or remove reflectors with a twist of the wrist—thanks to V-51's neoprene rubber ring attachment."

MR. PLANT OWNER Says: "Nothing beats this fixture for economical service and maintenance! My men can service it safely and quickly—*without tools!* Converts just as easily to high or low wattages. We're saving on lamps, too. V-51's shock-absorbing socket lets us use standard lamps instead of more expensive mill-type bulbs."

MR. ELECTRICAL CONTRACTOR Says: "These V-51 fixtures are tops when it comes to quick and easy wiring. The line's complete, too—gives me a pendant, ceiling or bracket type mounting for every kind of installation. Best of all, these fixtures are efficient and dependable. I know my customers are going to be satisfied with them."



MR. ELECTRICAL WHOLESALER Says: "Appleton V-51 Series Vaportight Fixtures answer my stock-keeping problems perfectly. The line's variety—*plus complete interchangeability of parts*—means I can meet 256 different fixture requirements with only a small investment in inventory!"

Write for Bulletin 5-A

Sold Through Electrical Wholesalers

APPLETON ELECTRIC COMPANY

1709 Wellington Avenue • Chicago 13, Illinois

LOS ANGELES 12, 100 N. Santa Fe Avenue
SEATTLE 9, 115 Ray Street
SAN FRANCISCO 1, 655 Minna Street
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MALLEABLE IRON CONDUIT FITTINGS
OUTLET BOXES • SWITCH BOXES
EXPLOSION-PROOF FITTINGS • FEEDLITES

APPLETON ELECTRIC PRODUCTS

skyscraper of security

You can get extra safety from Security Tape. Its tight-grip adhesive coupled with high-tensile strength fabric make Security extra reliable.

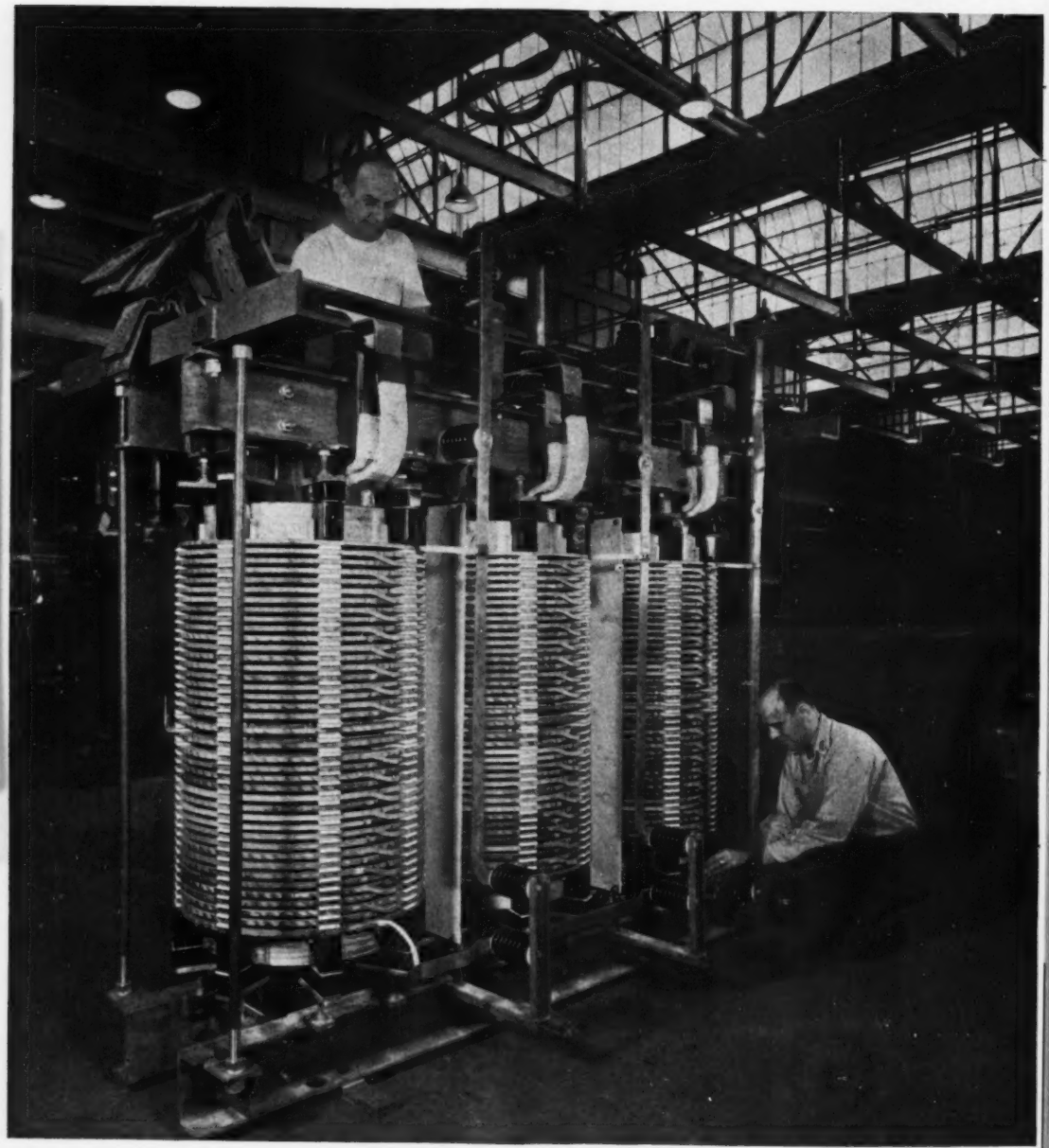
Security tears straight and will not ravel. No pinholes to cause dangerous leaks. Security is both dependable and long-lasting —for electrical and general purpose jobs.

Ask your wholesaler for Security.

UNITED STATES RUBBER COMPANY

TAPE DEPARTMENT • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

New G-E Development Results



Typical core-and-coil assembly of a 1250-kva sealed dry-type transformer to be installed in an outdoor substation.

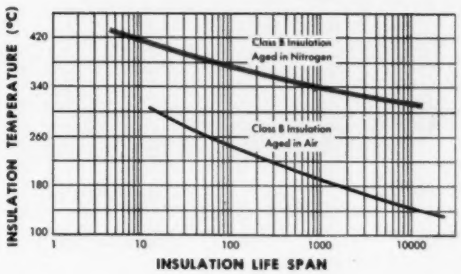
in 8% Price Reduction on Sealed Dry-Type Transformers

SAVINGS MADE POSSIBLE THROUGH RESEARCH ON CLASS B INSULATION IN NITROGEN

Last year General Electric announced sealed dry-type transformers—using Class "H" inorganic insulation in hermetically sealed nitrogen-filled tanks.

Now, a new development opens the way to real economies. G-E engineers—after extensive tests—have found that Class "B" insulation ***sealed in nitrogen*** can be operated at temperatures previously thought practical only with the more expensive Class "H" insulation—and with a life expectancy ***equal to or greater than*** Class "B" insulation operated at lower values in conventional ventilated construction.

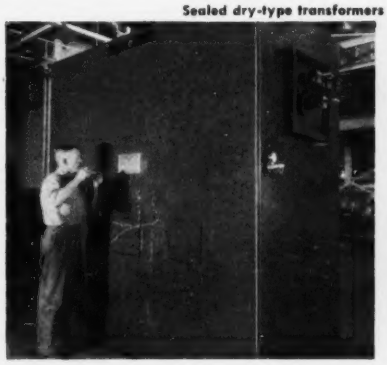
The use of Class B insulation permits an immediate 8% reduction in prices. Previous sealed dry-type transformers with Class H insulation were priced 20% higher than conventional open dry-type units, but the new Class B insulated units are priced only 10% higher.

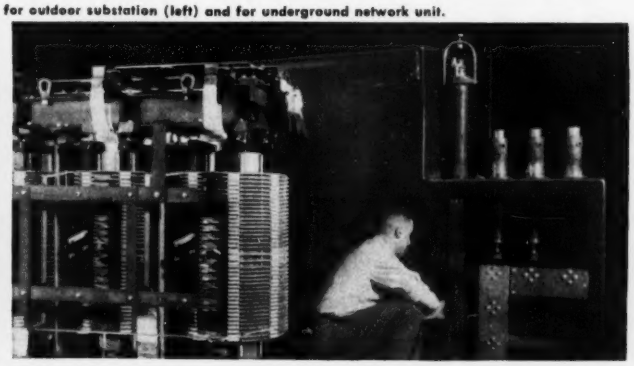


Ratings of the sealed dry-type transformers extend through 1500 kva and 15,000 volts. Units are also available with G-E metalclad switchgear for load-center installations, or with network protector and high-voltage switch as a completely equipped network unit.

For details, contact your nearest G-E Apparatus Sales Office or write Apparatus Dept., General Electric Company, Schenectady, N. Y.

Sealed dry-type transformers for outdoor substation (left) and for underground network unit.





FOR INDOOR, OUTDOOR OR UNDERGROUND SERVICE

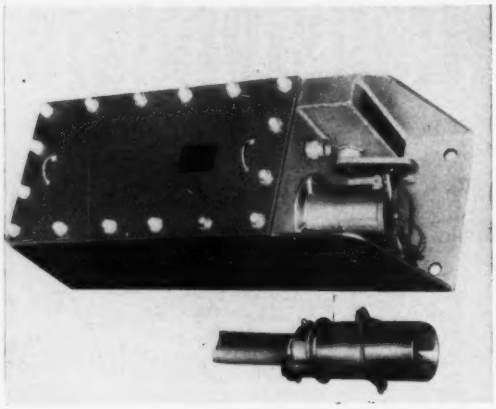
Sealed dry-type units like those above have three main advantages: (1) Nitrogen-filled tanks—no oil to maintain. (2) Smooth exteriors—no radiators to complicate installation, no tubes to raise painting costs. (3) Hermetically sealed. Welded tanks have metal-to-glass sealed bushings—coils need no cleaning or drying.

402-81

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

PRODUCT NEWS



Outlet Breaker for Docks and Piers

(1) Westinghouse Electric Corp. (AD), 410 Bush St., San Francisco 8, Calif.

These new pier outlet breakers are designed to offer a simplified standard method of supplying auxiliary power to ships at any dock or base. They can be placed along docks or piers, giving full protection for power cables and convenient disconnects.

The units use the manufacturer's type AQB circuit breakers of class HI design, in accordance with Navy Department specification 17BI (INT.). These outlet breakers are available for either 250-v d-c or 440-v a-c, 2- or 3-pole service, with trip ratings from 70 to 600 amp. If more power is required the units can be installed in groups.

Power from the breaker is fed to a standard watertight receptacle capable of interrupting its rated load. Receptacles can be supplied for either 3- or 4-wire service.

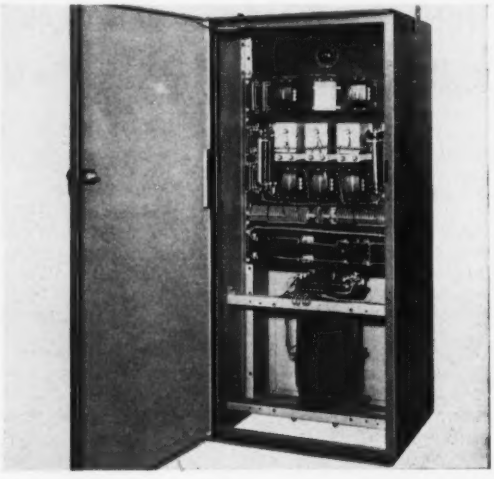
The enclosure is made of ¼-in. steel plate, seam welded to give watertight construction. Extended enclosure ends prevent fastening hawsers to the unit. The unit is electroplated with cadmium and tin, then sprayed with aluminum paint for protection against salt air and water. The enclosure has a Navy-type heavy-duty indicating light. Heaters inside the unit minimize condensation. A terminal board is provided inside unit for pilot light and heater connections.

Industrial Fixture

(2) The Miller Co., Meriden, Conn.

The Convaire luminaire for two 40-w general line fluorescent lamps comes in 49⅛- and 98¼-in. lengths. The new G-E 89G 343 2-lamp, small cross section ballast has been used to streamline the fixture, which can be installed individually or in continuous rows, pendant or surface mounted. Mounting may be on stems, chains or messenger cable, from the knockouts or by clamp hangers that grip the flanged-top wireway channel and permit clamp mounting anywhere along its length. Twin-turret lampholders on 3½-in. spacing, prevent turning or falling lamps and facilitate lamp insertion and removal.

Two types of open-end reflectors are available: solid top with an over-all efficiency of 83%; apertured top with an over-all efficiency of 87% with 80% of the light downward and 7% upward. Folder 1C gives details.



New Development on Regulating Equipment

(3) Allis-Chalmers, Milwaukee, Wis.

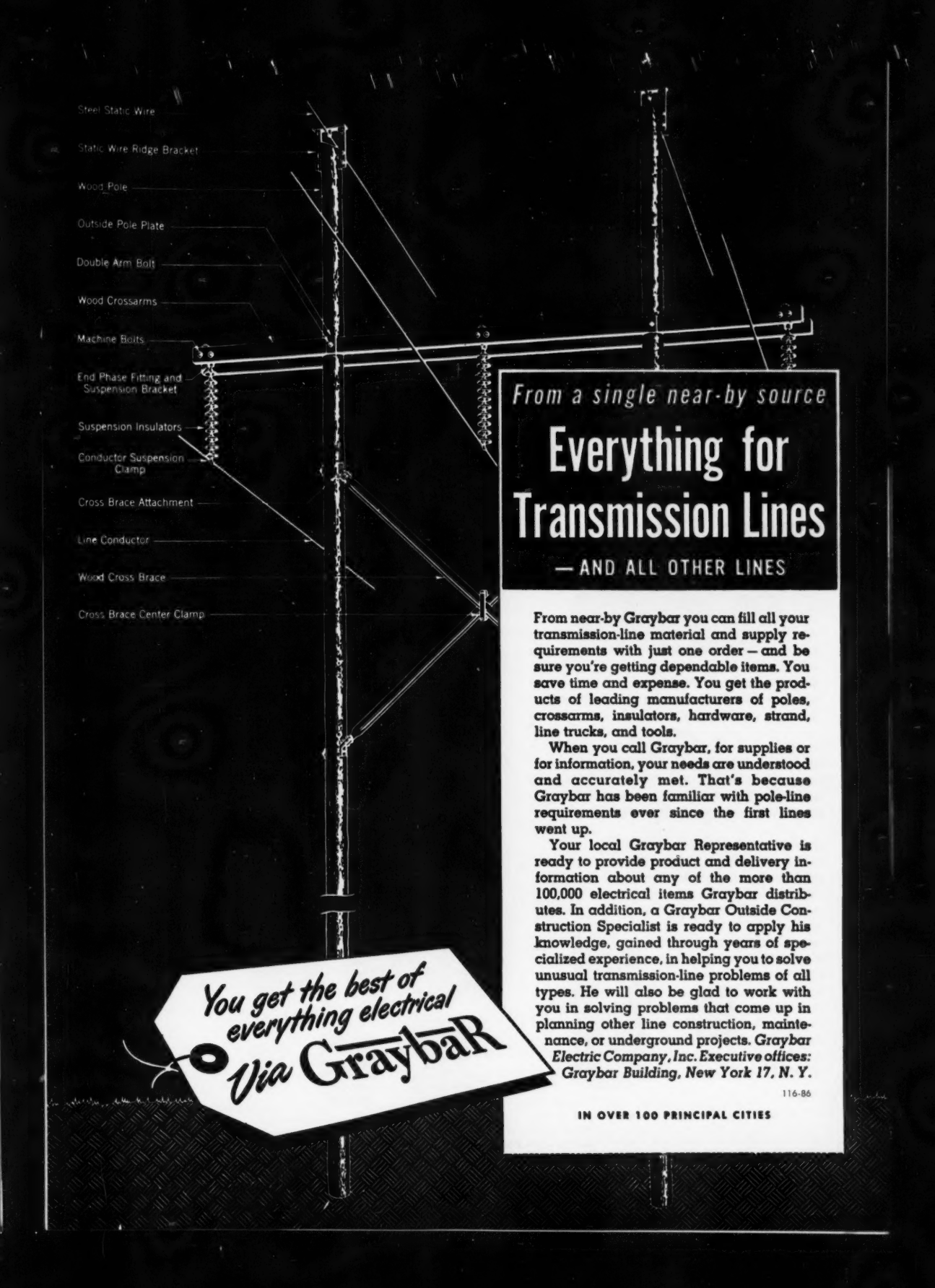
A voltage measuring and control panel that has no moving parts or electron tubes is the latest development in connection with the Regulex rotating amplifier-type generator voltage regulator.

This static regulating equipment is built in standardized panel sections that can be mounted either in a cubicle or in switchgear units. It consists of a compensating unit for reactive current division, stabilizer panel, static voltage-measuring circuit, a battery excitation switch and resistor and a damping transformer assembly mounted from top to bottom in the cubicle.

A knob on the front of the reactive compensating unit adjusts the autotransformer while reactors and other units are mounted on the rear of the panel.

In addition to the improved cubicle, the entire equipment includes a Regulex motor-generator set, manual- or motor-operated main exciter field rheostat, voltage adjusting equipment and devices for transfer from manual to automatic operation.

The Regulex exciter as a regulator is versatile when applied to control of synchronous machines, the manufacturer states. Standard elements are available not only to control voltage, power factor or current but also to prevent over or under excitation.



From a single near-by source

Everything for Transmission Lines

— AND ALL OTHER LINES

From near-by Graybar you can fill all your transmission-line material and supply requirements with just one order — and be sure you're getting dependable items. You save time and expense. You get the products of leading manufacturers of poles, crossarms, insulators, hardware, strand, line trucks, and tools.

When you call Graybar, for supplies or for information, your needs are understood and accurately met. That's because Graybar has been familiar with pole-line requirements ever since the first lines went up.

Your local Graybar Representative is ready to provide product and delivery information about any of the more than 100,000 electrical items Graybar distributes. In addition, a Graybar Outside Construction Specialist is ready to apply his knowledge, gained through years of specialized experience, in helping you to solve unusual transmission-line problems of all types. He will also be glad to work with you in solving problems that come up in planning other line construction, maintenance, or underground projects. ***Graybar Electric Company, Inc. Executive offices: Graybar Building, New York 17, N. Y.***

116-86

IN OVER 100 PRINCIPAL CITIES

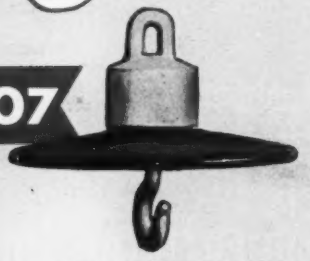
You get the best of everything electrical

Via GraybaR

1873 THOMAS INSULATORS our 78th year RELIABILITY 1951

DEMAND *Proof* OF PERFORMANCE

1907

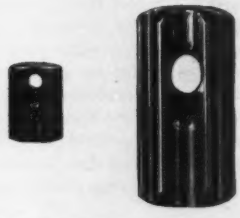


● Fig. 1—In 1907, THOMAS was FIRST with the CAP-AND-PIN Suspension Insulator.

1951

● Fig. 2—In 1951, THOMAS is STILL the Standard of Comparison.

● Fig. 3—Typical "Quiet-Type" Insulator*.



● Fig. 4—Guy-Strain Insulators

Let us repeat, "All insulators are not alike". To make an insulator that will do its job the trouble-free way . . . over a span of many years . . . requires EXPERIENCE. Thomas has that experience.

Since the beginning of the Electrical Industry, Thomas has consistently kept pace with the Industry's astonishing growth. Two early mileposts in our progress come to mind.

In 1893, all of the porcelains used in the lighting arrangement for the World's Fair at Chicago were Thomas.

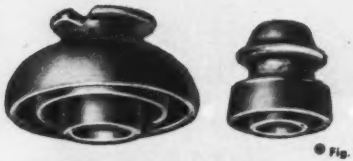
In 1907, Thomas designed and made the first Cap-and-Pin Suspension Insulator. UNITS INSTALLED THAT YEAR ARE STILL GIVING TROUBLE-FREE SERVICE AFTER 44 YEARS OF CONTINUOUS OPERATION.

More recently, Thomas pioneered and patented a complete line of "Quiet-Type"* Insulators which are guaranteed to eliminate insulator radio interference.

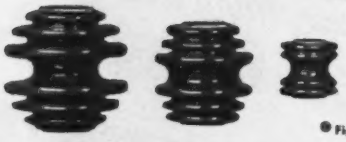
These are among the many Thomas "Firsts" and contributions which have helped the Electrical Industry reach its present position.

TODAY, in our 78th year, we are ready with improved facilities and increased capacity to meet the most exacting needs of the Industry. After all is said . . . it's still quality that counts plus proper designing, precision manufacturing . . . and PROOF OF PERFORMANCE. Why gamble?

*Patent No. 2154387



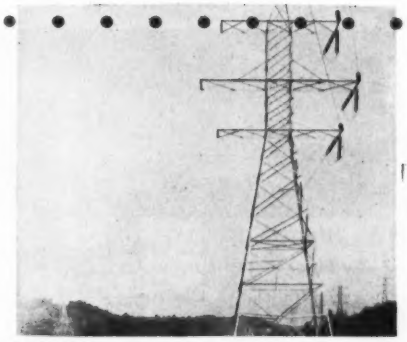
● Fig. 5—Pin-Type Insulators



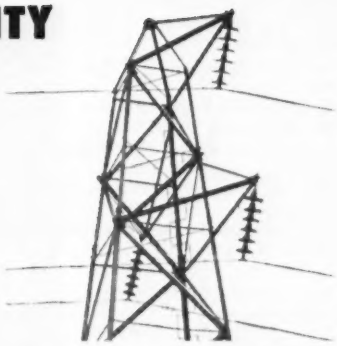
● Fig. 6—Spool Insulators.

ENGINEERS, MANUFACTURERS AND DESIGNERS SINCE 1873

FOR SUPERIOR INSULATOR QUALITY



1931 ● Fig. 7—2660-foot span of 69-mile, 132-kv line equipped with Thomas Insulators installed in 1931.

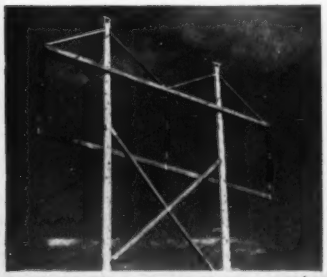


1907 ● Fig. 8—Central California line on which Cap-and-Pin Insulators were first used in 1907.

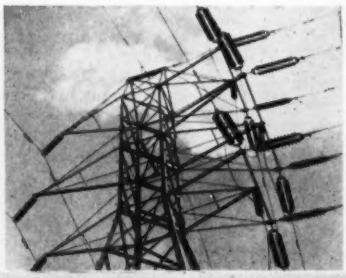
Specify Thomas Insulators - The Best by Line Test

The R. Thomas and Sons Company is a manufacturer and designer of all types of porcelain insulators . . . pin-type, switch, suspension, spools, guy-strain, bushings and special high-voltage porcelain. In addition, Thomas supplies associated line hardware, clamps, fittings, preformed armor rods, and so on.

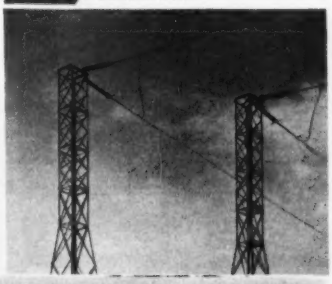
1938 ● Fig. 9—Large Western 230-kv line using 50,000 Thomas Insulators installed in 1938.



1948 ● Fig. 10—43,000 Thomas Insulators are installed on this 230-kv, 189-mile line.



1949 ● Fig. 11—5,000 Thomas Insulators make certain that this 132-kv, 14-mile line will give satisfactory service for decades to come.



1950 ● Fig. 12—On right-angle towers, Thomas Insulators have the stamina that assures long life and trouble-free performance.

The R. Thomas and Sons Co.

LISBON, OHIO

NEW YORK CHICAGO

Sales Representatives: E. B. Anderson Co., *Detroit* • Paul Berry, *Oklahoma City* • Ken H. Bost, *Seattle* • Butler & Land, *Dallas* • R. E. Cunningham & Son, *Los Angeles* • Electric Supply Co., *Albuquerque* • Engineer Sales Corp., *St. Petersburg* • R. F. Hamilton & Associates, *Denver* • R. H. Harper, *St. Louis* • Geo. E. Hann Company, *San Francisco* • W. J. Hugo, *Minneapolis* • Leiser & Company, *Philadelphia* • Lynn Elliott Company, *Houston* • W. C. Milburn, *Chattanooga* • John G. Pettijohn Company, *Knoxville* • H. E. Ransford Co., *Pittsburgh* • Redmond Supply Co., *Phoenix* • J. F. Schaefer & Co., *Kansas City* • R. J. Sullivan & Company, *Boston* • Walter E. Thompson, *Birmingham* • E. E. Torkell, *Memphis* • Triangle Electric Supply Company, *El Paso* • United Electric Supply Co., *Salt Lake City* • Joe Williams, *Little Rock* • *Representatives in other principal cities*

Suspension Light

(4) The Pyle National Co., 1334 N. Kostner Ave., Chicago 51, Ill.

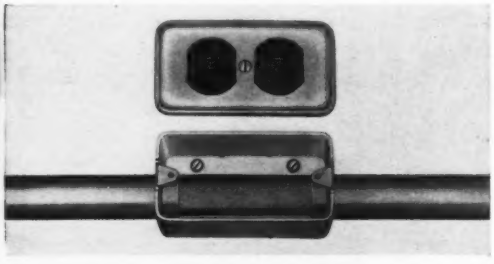
A new development in an overhead suspension, underside illuminator, the Anchorlite, is for temporary lighting inside or under equipment at platforms and in shops. It can be used inside freight cars, trucks and trailers at loading platforms, underneath equipment in auto service stations, repair shops, etc., and in warehouses and stock rooms for lower-bin lighting.

The light has a wide range of movement. It is designed to swing free on a swivel when suspended on a stationary bracket and may also be suspended from a messenger wire to slide the full length of a bay.

A spring-loaded telescopic device gives up to 3 ft of expansion in length with a firm supporting tension. The manufacturer states that the anchoring arm is easily pulled down and hooked under freight car or trailer door opening or under auto hood, fenders, bumpers or body. Light is projected inside or under support.

The light is released from operating position by unhooking it with a slight downward pull. Upon release, it automatically retracts to the overhead, out-of-way position. Should car, trailer or auto be moved while the light is hooked, no damage will occur, the manufacturer states, because excessive tension automatically releases the anchoring arm.

The device can be supplied with a mercury switch in the cord that automatically turns on the light when anchored in position for use and turns off light when released.



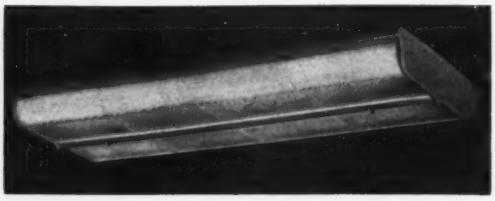
Raceway Service Fitting

(5) National Electric Products Corp., Chamber of Commerce Bldg., Pittsburgh 19, Pa.

A service fitting for Florduct is made of 14-gage steel and designed to preserve a continuous raceway base. It is constructed to eliminate hazards from abuse and water seepage and is electrogalvanized for rust resistance.

The fitting housing is installed over the raceway base without cutting the raceway. After the housing is installed and conductors laid in, the capping of the 2-piece raceway is snapped into place and the receptacle wired. Although the fitting is furnished with a duplex receptacle, it will accommodate all standard devices.

The new fitting is fastened directly to the floor, making a sturdy and rigid installation. Positive grounding is assured because of the manner in which the bottom of the fitting grips the base of the continuous raceway that runs through it. After installation wiring of receptacles is simple, the manufacturer states.



New Fluorescent Luminaires

(6) Holophane Co. Inc., 342 Madison Ave., New York 17.

The appearance of recessed construction, without the expense of roughing in, is claimed for the 9300 series of surface-attached Holoflux luminaires. According to the manufacturer, the effect is gained by extreme shallowness (the units are 4½ in. deep) and styling.

These units have brightness control across and along the axis of the lamps. The series can take two or four fluorescent lamps of either the conventional bipin or the new instant-start single-pin type, both 4 and 8 in. Easy removal of the Controlens and snap shut hinged doors is featured. A small percentage of upward light illuminates the ceiling, and absence of glare is claimed for even the longest continuous runs. Easy installation and minimum depreciation are other features listed by the manufacturer.

New Joint Reinforcing Sleeve for Power Cables

(7) The Okonite Co., Passaic, N. J.

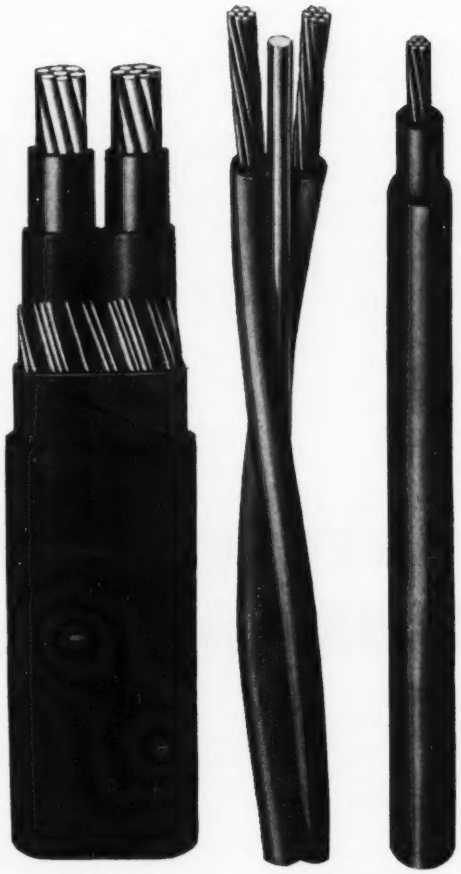
A simple modification in joint design is claimed to triple the life of paper-insulated power cables. This modified design, through the addition of a reinforcing sleeve to an otherwise standard joint, is said to offer an economical solution to the cracking of the lead sheath at joints caused by cyclic bending in manholes.

Such failures of the lead sheath are attributed to the concentration of stress at the joint wipe caused by movement of the cable under load variations. Correction of this condition can be obtained, according to the manufacturer, by distributing the stress along the cable to prevent concentration at any particular point. The device used in the Garrison joint to provide this stress distribution is a tapered Okometal lead sleeve placed around the lead sheath and fused into the wipe.

Tests show that the Garrison joint prolongs the bending fatigue life of the cable as much as three times its normal value. The joint differs from a normal joint only in the use and method of applying the tapered sleeve. It can be applied easily to existing cables as well as to new installations, on either plain lead coverings or on lead cables with protective coverings. It can be used with any standard straight-joint assembly. Bulletin OK-1051 gives complete details.

(For bulletins, fill in coupon on page 58)

SERVICE ENTRANCE CABLES



TYPE SE TYPE SS TYPE USE

Roebling makes a wide line of service entrance and service drop cables

SERVICE CABLES are an important part of Roebling's complete line of electrical wires and cables. Whatever your requirements for getting electrical energy from the utility's secondary to the meter, the right Roebling underground or overhead cable will give you the fullest measures of dependability...and economy.

All types and styles of Roebling Service Entrance Cable are made in the constructions best adapted for their own particular service range. From copper wires to protective jackets these cables are made entirely in Roebling plants where modern machines and methods assure highest, uniform quality.

A large part of Roebling's complete wire and cable line is required in today's rearmament program. You can count on the Roebling organization and distributors, however, to give you the best possible delivery service. John A. Roebling's Sons Company—San Francisco—Los Angeles—Seattle.

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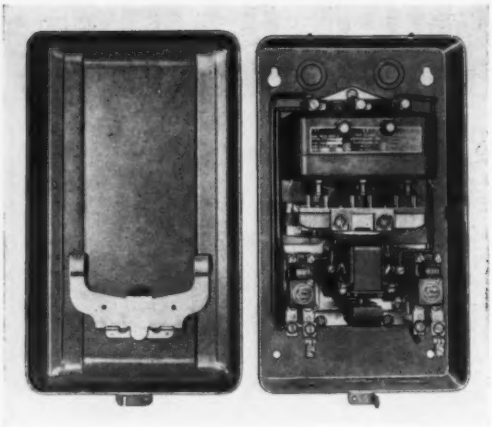


Motor Starters With Arc Extinguishing Principle

(8) The Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio

Combined use of strong multiturn magnetic blowouts with twin-break contacts is featured in the CY-2 starter for a-c motors.

A steel case, enclosing each arc chamber, carries the flux. The arc is extinguished by applying the effect of the blowout coil concentric with the contact. The steel arc chamber and center stud form the magnetic circuit around each contact. The magnetic field is concentrated in a cone from the steel center stud supporting the upper contact to the steel rim in the lower arc shield surrounding the lower contact.

Two different actions occur, changing each half cycle with the reversal of the current. In one current direction the arc is forced to the outer edge of the upper contact, lengthened and rotated. In the other, the arc is rotated and forced to the middle of the upper contact. In each case, the magnetic field tends to extinguish the arc, either by lengthening it or confining it.

According to the manufacturer, the most important action is the constant moving of the arc. In its forced rotation, it must continually move from a hot spot to a relatively cool spot.

No carbonizing of insulating material can occur because all parts in the arc chamber are copper, brass and steel, the announcement states. The action of the blowouts assures that any arcing that occurs will be uniform over the entire contact surfaces.

Snap-On Devices

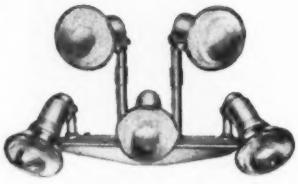
(9) Fast Lok Mfg. Co., Ash St. at Bedford, Bridgeport 5, Conn.

New items in the manufacturer's line of devices with snap-on studs are; adjustable hung-ceiling bar-hangers with snap-on studs and end straps; rigid upright box supports with snap-on button for fireproof construction work; rigid upright conduit supports with tie-straps for fireproof construction work. Details are given in Bulletin No. 3 FL.

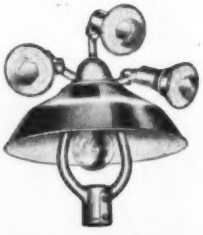
A BRIGHT IDEA FOR BETTER BUSINESS

...KILLARK CLUSTER-LIGHTS

Good lighting attracts good business Customers are irresistably drawn to the clean, bright areas created by Killark Cluster-Lites. Check these features for top lighting efficiency.



- **FLEXIBLE:** Spot every lamp exactly where it's needed.
- **WEATHERPROOF:** Sealed Beam Lamps are completely enclosed against dust, dirt, moisture.
- **RUSTPROOF:** Aluminum construction for longer, uninterrupted service.
- **LOW MAINTENANCE:** Simple, compact design; no reflectors to clean or re-paint.
- **COUNTLESS USES:** Filling stations, parking lots, drive-ins, sport areas, etc.



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Los Angeles—412 Seaton St.
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ELECTRIC MANUFACTURING COMPANY

Vandeventer and Easton Aves. St. Louis 13, Mo.

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4 G-E WIRING FACTS
WHEN YOU EXPAND YOUR ELECTRICAL SYSTEM

General Electric Construction Materials Department at Bridgeport is headquarters for wiring progress

Through constant research and precision manufacturing methods, the G-E Construction Materials Department sets the pace with modern and high-grade wiring materials.

Through distributors in every locality and specialists in the local G-E offices, the G-E Construction Materials Department offers you complete services on any type of wiring problem.

For information on any G-E wiring materials, contact your local G-E Construction Materials distributor, or write Section K58-625, Construction Materials Department, General Electric Company, Bridgeport 2, Conn.

1. Q. *HOW CAN YOU REDUCE INSTALLATION TIME FOR NEW POWER AND CONTROL CIRCUITS IN LIGHT INDUSTRIAL AND COMMERCIAL BUILDINGS?*

A. Use G-E Electrical Metallic Tubing. This lightweight, thin-wall tubing cuts installation time because it's easy to handle, easy to bend, and easy to install.

2. Q. *WHAT RACEWAY WITHSTANDS MACHINE VIBRATION AND PROVIDES BOTH FLEXIBILITY AND PROTECTION?*

A. G-E flexible steel conduit is ideal for machine-wiring installations. This tough raceway can be hand-shaped around obstructions where space is limited. It stands up under severe operating conditions where motors and other equipment cause vibration.

3. Q. *WHAT ARE THE ADVANTAGES OF THE G-E REMOTE-CONTROL WIRING SYSTEM IN INDUSTRIAL AND COMMERCIAL BUILDINGS?*

A. G-E remote-control wiring system provides control of corridor lights from central locations to assist watchmen and cleaning crews. The small lightweight control wires can be removed easily as partitions and floor layouts change.

4. Q. *HOW CAN YOU SAVE LAYOUT TIME WHEN YOU EXPAND YOUR PRESENT ELECTRIC POWER SYSTEM?*

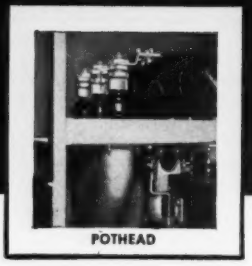
A. G-E Varnished-cambric Interlocked-Armor cable—carrying its own flexible raceway—presents no complicated layout problems. This ready-to-install cable can be bent around obstructions, strung over long runs, and laid up on existing beams, or installed on racks.

You can put your confidence in—

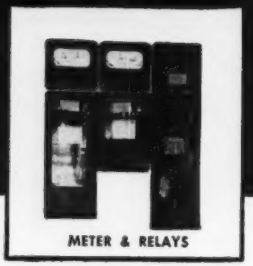
GENERAL ELECTRIC

SCS SUBSTATIONS

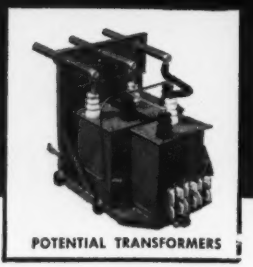
Components Arranged for



POTHEAD



METER & RELAYS



POTENTIAL TRANSFORMERS

Fitted Together in a Single Modern-Appearing Housing—Transformer and Switchgear are Individually Built—Each Designed for Top Performance and Arranged for Maximum Accessibility.

ALLIS-CHALMERS SCS Single Circuit Unit Substations are designed for maximum accessibility . . . to save you time and money in testing, inspection and maintenance routines.

HERE'S HOW IT'S DONE:

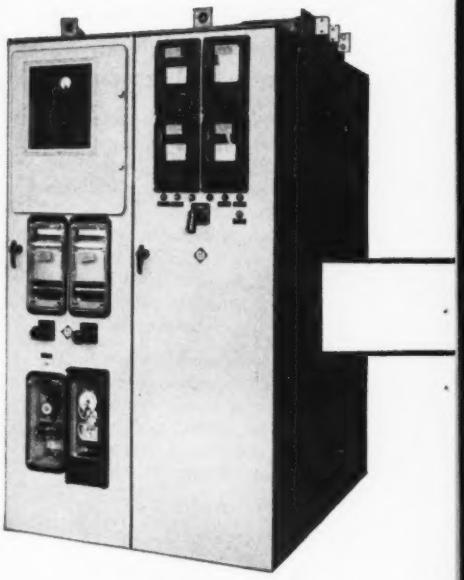
1. Transformer and switchgear are divided into two independent sections, both contained in the single substation housing.

2. All switchgear components — including potential transformers, current transformers and control power transformers — are grouped in one section. Potential and control power transformers are drawout mounted for easiest inspection, testing, maintenance, or replacement.

3. Meters, relays and controls are dead-front mounted behind the front door for accessibility and safety.

4. The single rear door is hinged for quick, convenient access to internal power connections . . . testing and inspection are made easy . . . gasket maintenance is reduced.

A-3267



Pioneers in Load Ratio Control
Originators of 5/8% Step Regulators

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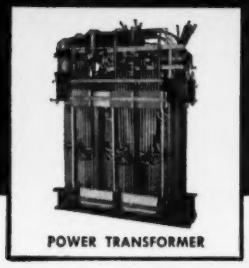
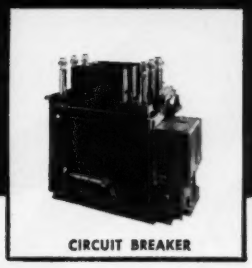
ARE DESIGNED WITH

Low Cost Maintenance!



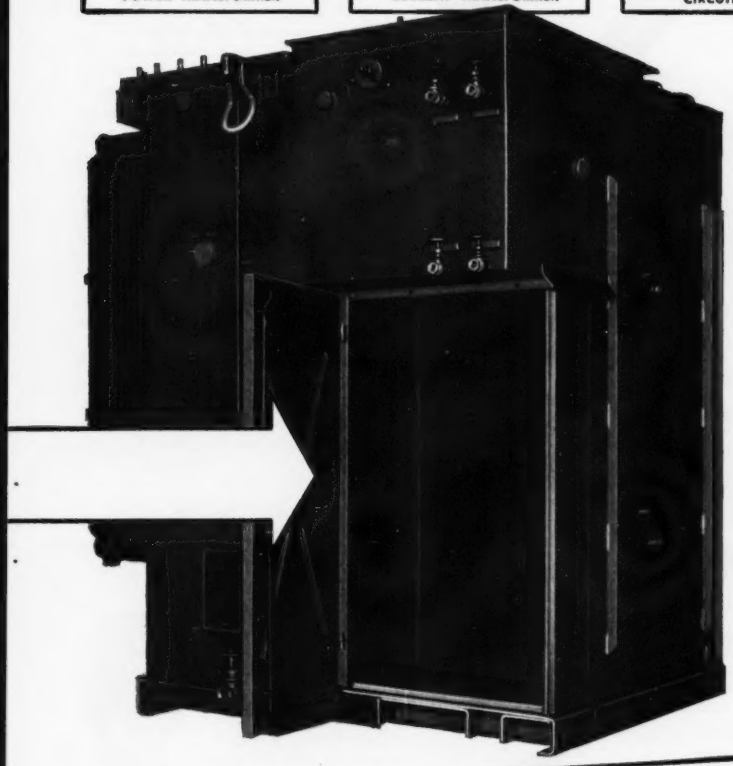
POWER TRANSFORMER

CURRENT TRANSFORMER



CIRCUIT BREAKER

LRC MECHANISM



WHAT CAN THIS ACCESSIBLE DESIGN MEAN TO YOU?

First—Lower Maintenance. Easily accessible components reduce time and effort required for servicing.

Second — Easier Testing and More Thorough Inspection because components are compactly arranged, highly accessible.

Third — Greater Safety. Operators and meter readers have access only to the dead front controls.

To learn more about these modern appearing SCS Unit Substations and how they can be fitted into your distribution system quickly, call your nearby A-C Sales Office or write Allis-Chalmers, Milwaukee 1, Wisconsin for bulletin 11B7457.

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When it comes to judging the worth of pliers, ask the man who uses them every day. He'll tell you Kleins—for their hand fit—their proper balance—their carefully matched knives that stay keen longer.

The same top quality that typifies Klein pliers is also characteristic of other Klein tools and equipment—safety straps and belts, climbers, grips and wrenches. Men who know good tools have been choosing Kleins since 1857.

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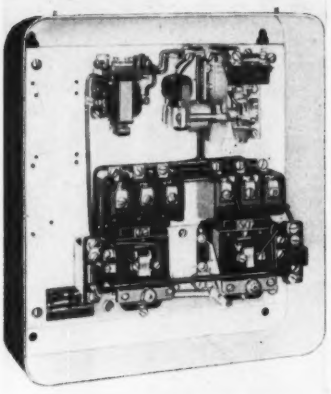


Laundry Washer Control

(10) Allen- Bradley Co., Milwaukee, Wis.

This new control panel, Bulletin 723, is for use with squirrel-cage motors driving washing machines used by laundries and dry cleaners. To prevent snarling and tangling of clothes washer cylinders are operated in one direction for a certain length of time, then reversed and rotated in the opposite direction for the same length of time. A dwell period is provided between the reversals of the machine.

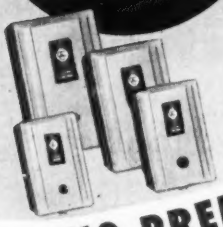
These panels contain the necessary control equipment to perform this reversing and dwell function. They give four reversals per minute with an adjustable dwell period. Panels are supplied for 2-wire control, operated from a maintained contact push button, or 3-wire control, used with a momentary contact push button. Dwell point between reversing periods is adjustable from ¼ to 10 seconds.

Cord Connector Bodies

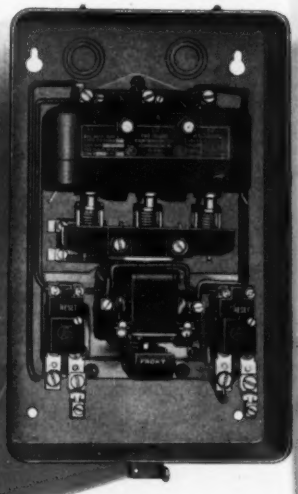
(11) Rodale Mfg. Co. Inc., Emmaus, Pa.

Four new Turn-Tyte cord connector bodies are designed to match the manufacturer's line of armored attachment plug caps and flush receptacles. Made for 2- and 3-wire, 10- and 20-amp service, they are said to have ample spacing around the terminals for quick and easy wiring. The 10-amp units accommodate cords 0.500-in. in diameter, and the 20-amp bodies take 0.625-in. cords. All UL listed, they are interchangeable with other interlocking devices now in use.

It's All New CLARK "CY" the AC MOTOR STARTER

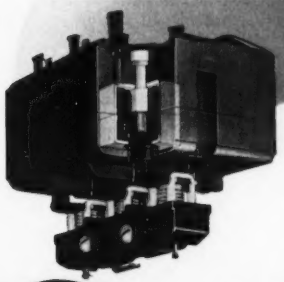


that gives you
MILL TYPE HEAVY DUTY CONSTRUCTION and DESIGN
at NO PREMIUM above regular starter prices!



Here for the first time is a line of AC Magnetic Starters that provide the extra protection and dependable operation usually associated with rugged Mill-type equipment—at NO EXTRA COST! The ingenious design of the arc chamber and an entirely new principle of arc interruption plus other refinements, give you these advantages:

- Forced rotation of arc minimizes burning and pitting of contacts.
- No filing, dressing or cleaning of contacts.
- No carbonization to shorten contact life or cause high operating temperatures.
- No accumulation of ionized gases between wiring terminals to cause phase-to-phase failures.
- No tools needed to inspect contacts.



Featuring MULTI-TURN MAGNETIC BLOWOUTS and Twin-Break Contacts

The advantages of strong blow-out coils and twin-break contacts are combined in the CLARK "CY" to give you new standards in starter performance. This is a FIRST in electrical control history.

Let a **CLARK** *application engineer show you what this new starter means to you in increased production and lower maintenance.*

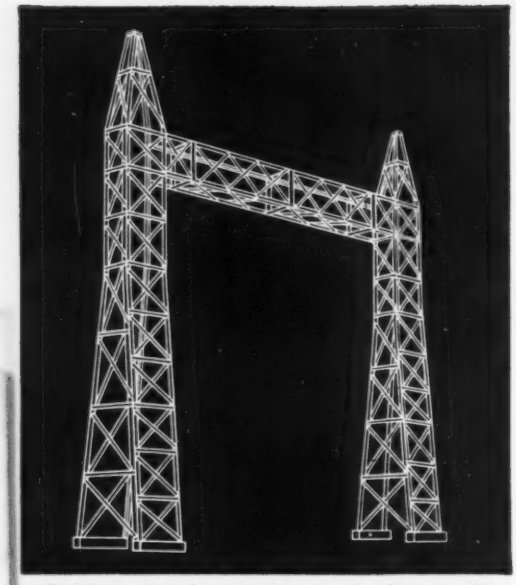
THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1142 EAST 152ND STREET, CLEVELAND 10, OHIO

Now.. G-E Outdoor Stations

with Standardized Structures

Available in voltage ratings from 7.5 to 230 kv

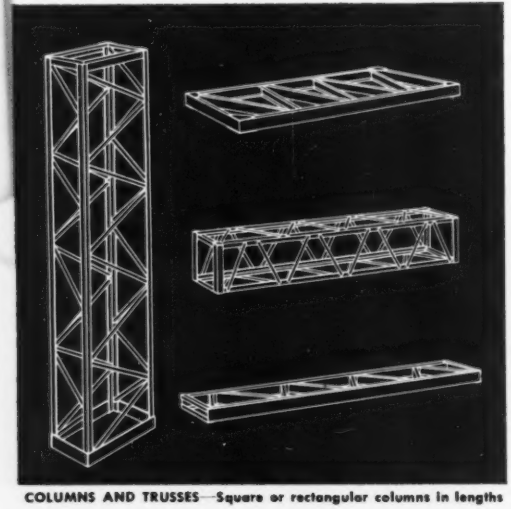


HIGH TOWER—Used for dead-ending incoming lines as well as support for incoming line disconnects. Lower truss supplied when required for support of oil circuit breaker isolating switches. Tower can be used singly or combined to make multi-bay arrangements.

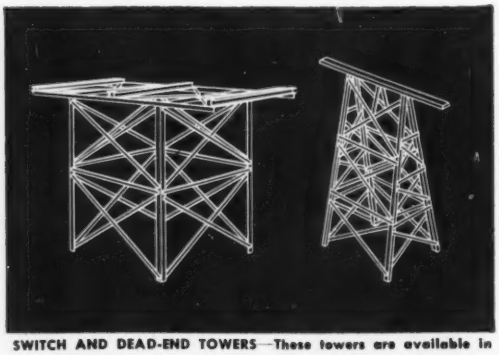
Designed as a result of 35 years of experience in outdoor station construction, G-E standardized steel structures now mean lower installed costs, less time required for station layout and engineering.

The typical components shown on this page can be combined to form an infinite variety of station arrangements. The design of all the electrical and structural items in an outdoor station must be co-ordinated mechanically and electrically if the items are to form a satisfactory installation. Sensible standardization of structural steelwork now makes it all the more practical to order it as one pre-designed component along with the other station equipment.

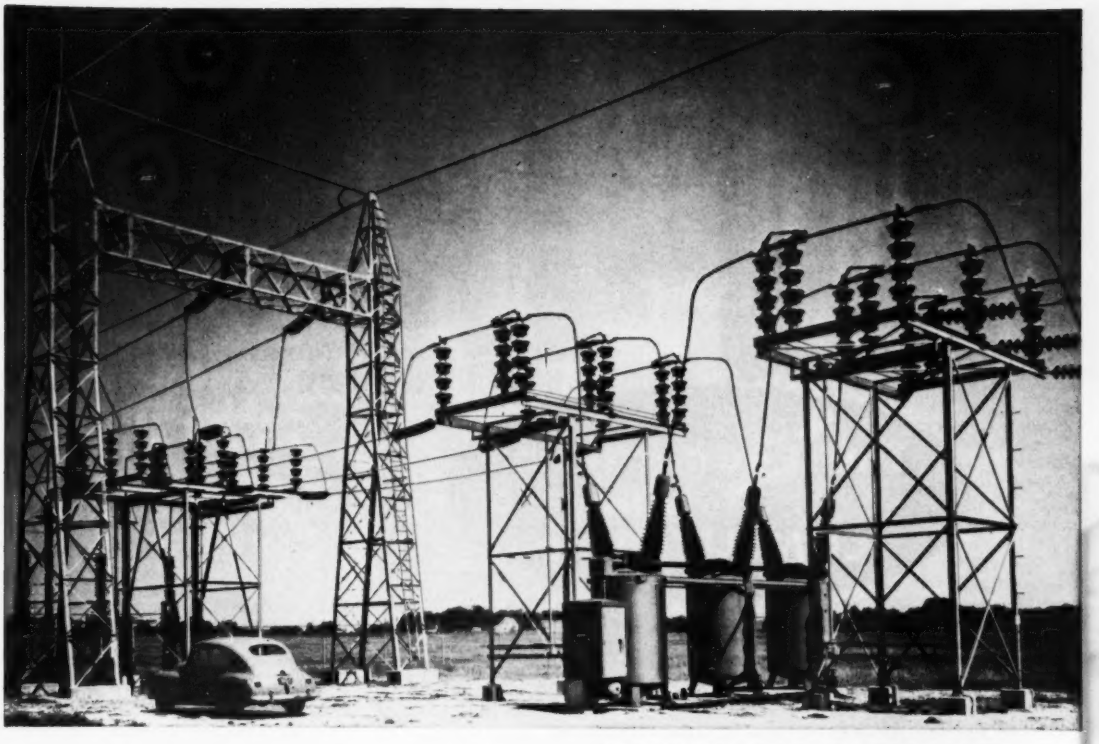
Development of these structures was a logical step in the trend towards increased standardization as a means of achieving maximum savings of time and money.



COLUMNS AND TRUSSES—Square or rectangular columns in lengths of 13'6" through 38'. Together with flat and box-type trusses, they form easily assembled "building blocks" for a wide variety of structures for mounting switches, fuses, lightning arresters, buswork, current transformers and other equipment.



SWITCH AND DEAD-END TOWERS—These towers are available in standardized dimensions to suit various voltage ratings. Design is based on a long experience with similar structures and requirements expressed by a long list of users. Other equipment available includes insulator pedestals and equipment stands.



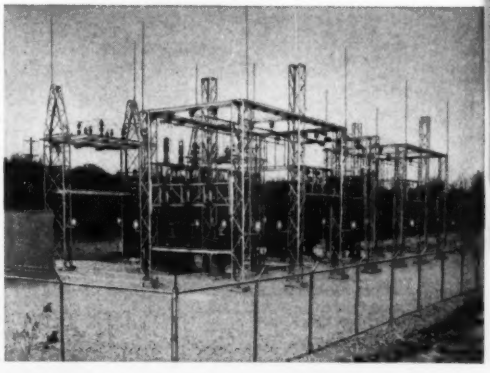
161-KV STATION showing use of standardized switch towers and high tower with one horizontal truss. This station was erected by the St. Joseph Light and Power Co., Marysville, Mo., one of the many users of G-E standardized outdoor stations.

Complete stations in standardized, pre-designed units—adaptable to every type of layout

The two outdoor stations shown here are typical examples of "building block" construction using G-E standardized structures, together with G-E switchgear, transformers and other equipment.

By ordering complete G-E outdoor stations with pre-designed, standardized structures, the tedious job of engineering and detailing separately ordered items is avoided. There is only one specification, one purchase transaction for each station. And with less time lost on detailed structural engineering, personnel can give more attention to the more important work of long range system planning.

For details of G-E standardized structures, write for Bulletin GEA-5573. For other information to help in outdoor station planning, ask for GEA-1040—Power Transformers, GEA-4985, 1642 and 4407—Oil Circuit Breakers, GEA-4980—RF Disconnecting Switches, and GEA-1304—Thyrite Lightning Arresters. *General Electric Co., Schenectady 5, New York.*



CINCINNATI GAS & ELECTRIC CO. MIDWAY STATION constructed entirely of G-E standardized structural units including latticed columns and trusses. Use of these components saved time and expense in designing, and expedited erection.

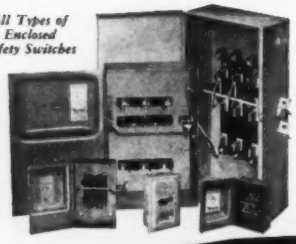
GENERAL ELECTRIC

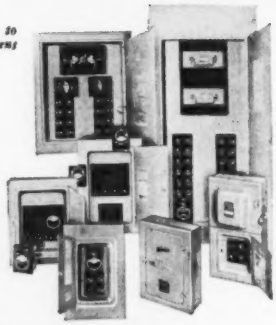
853-5

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

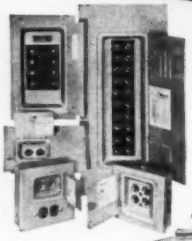
Service Equipment to Meet Every Requirement

All Types of Enclosed Safety Switches

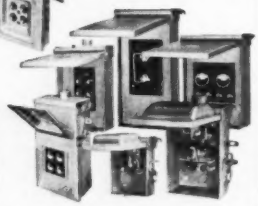




The General Line is the COMPLETE Line



Extensive Line of Branch Circuit and Residence Panels



A Complete Line of Weatherproof and Raintight Service Equipment and Safety Switches

General makes a complete line of Enclosed Safety Switches, Service Entrance Equipment and Branch-Circuit or Residence Panels—all designed for *greater convenience, better appearance and long trouble-free performance.*

Send for new Catalog No. 5103 and latest price list.

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1041 Sixth Ave. S.
Elliot 2367

Spokane 8, Washington
Keeler, White Co.
So. 121 Madison St.
Madison 7974

General Switch Corp.
15 Roebling Street Brooklyn 11, N. Y.

(12) FAN—A new floor fan for home and office is claimed to be draft free and completely safe. It has 10-in. blades, deep pitched; two speeds for variable air volume. For 110-120-v, 60-cycle a-c, comes with 2-speed switch, 8-ft cord. Made by Fasco Industries Inc., Rochester, N. Y.

(13) TAPE—A vinyl electricians' tape known as Permacel 29 is offered by Industrial Tape Corp., New Brunswick, N. J., for the electrical and automotive industries. Features claimed for it are thinness, electrical resistance, high stretch, high strength and resistance to oils, acids, greases, alkalies, etc. Underwriters' approved.

(14) TIMER—A new synchronous motor timer, type SY Promatic timer, that can be used for all time periods between ½ second and 24 hours has been introduced by General Control Co., Boston 54, Mass. It actuates five s.p.d.t. load contacts independent of the timer-control circuits. There are two separate solenoids, one to operate the clutch and timing mechanism, the other to actuate the load contacts. The timer resets automatically for each new cycle.

(15) ROD AND TUBING—Continuous extrusion of Teflon rod and tubing in diameters up to 2 in. has been announced by the Polymer Corp., Reading, Pa. Previously Teflon rod has been available in those diameters only in molded short lengths.

(16) FUSEHOLDER—A miniaturized indicating fuseholder claimed to spot blown fuses instantly is offered by Alden Products Co., 117 N. Main St., Brockton 64, Mass. In the 440-3FH, a neon bulb and double contacts are molded as an integral part of the crystal clear lens. The neon bulb glows when the fuse blows. It can be seen from any angle, giving immediate indication of trouble. This fuseholder requires mounting centers and clearance behind the panel of 1⅜ in.

(17) AMPLIFIER—An amplifier designed for d-c measurement and control operations in industrial processes requiring continuity of service has been introduced by Weston Electrical Instrument Corp., Newark, N. J., as model 1411 Inductronic d-c amplifier. Claimed to incorporate a high degree of stability and accuracy, the instrument is capable of measuring as an automatic process the related physical quantities of input devices such as thermocouples, radiation receivers, strain-gage bridges, resistance thermometers and photocells.

(18) ROTARY SELECTOR SWITCHES—The Daven Co., 191 Central Ave., Newark 4, N. J., announces that these switches are now available with up to 6 poles, 15 positions per pole, on each deck. A patented knee-action-type rotor arm is claimed to insure low contact resistance and uniform contact pressure over the life of the switches. Silver alloy contacts and rotor arms are used on all units. A new patented roller-type detent also is standard on all units and is claimed to give more positive action and longer life.

(19) CALCULATOR—An electrical calculator for copper conductors is available from Van Halst Calculator, P. O. Box 317, Wolcottville, Ind.

STANDARD ENGINEER'S REPORT

DATA

LUBRICANT Calol O.H.T. Grease

UNIT Automotive generator bearing

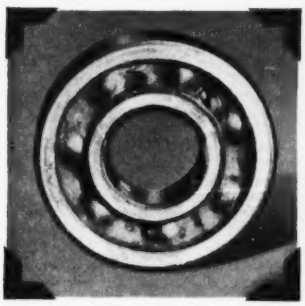
LUBRICATOR Sealed at installation

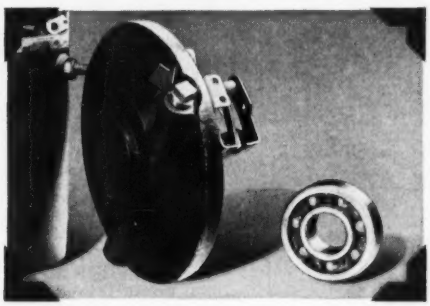
CONDITIONS Heavy-duty diesel truck engine

MILEAGE 70,000

FIRM H. G. Makelim Co., San Francisco—Oakland

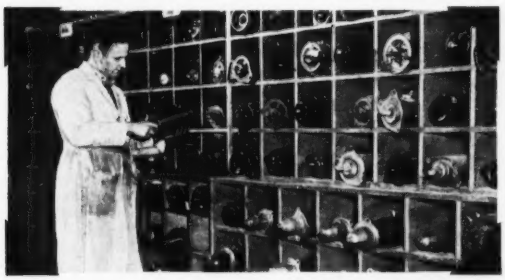
Sealed generator bearing still perfect after 70,000 miles!





ONE APPLICATION OF CALOL O.H.T. GREASE, sealed in the bearings when this diesel-engine generator was assembled by H. G. Makelim Co., prevented any bearing wear in 70,000 miles of heavy-duty truck service. Generator was disassembled at this time only because it needed new brushes, and for general inspection. Note a permanent plug replaces usual grease fitting.

70,000 MILES OF SERVICE did not affect or use up any of the CALOL O.H.T. Grease in the bearings. In special tests, one filling has lubricated bus-generator bearings perfectly for more than 150,000 miles.

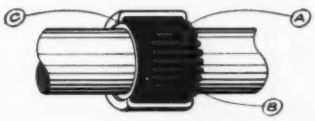


"WITH CALOL O.H.T. GREASE SEALED IN BEARINGS, we recommend installing generators without grease fittings," says Frank Balzarini, H. G. Makelim Co. Foreman. "CALOL O.H.T. eliminates need for greasing between overhauls. And eliminating fittings stops over-greasing—a big cause of wear and trouble."

REMARKS: The H. G. Makelim Magneto Repair Company, San Francisco and Oakland, one of the West's oldest automotive-electrical and carburetor repair firms, specializes in servicing equipment in the toughest automotive service—truck, bus and car fleets.

Besides generator bearings in this service, CALOL O.H.T. Grease is recommended for all types of bearings in service under extremely severe operating conditions.

How CALOL O. H. T. Grease protects bearings in severest operating conditions



Used in any type of bearing under any operating condition, high temperature-low speed, high speeds to 10,000 rpm, temperatures from minus 10° F. to 400° F., CALOL O.H.T. Grease will last indefinitely.

A. Contains special oxidation inhibitor—prevents rusting, corrosion, hardening of grease at any time.

B. Resists high temperatures — eliminates coking.

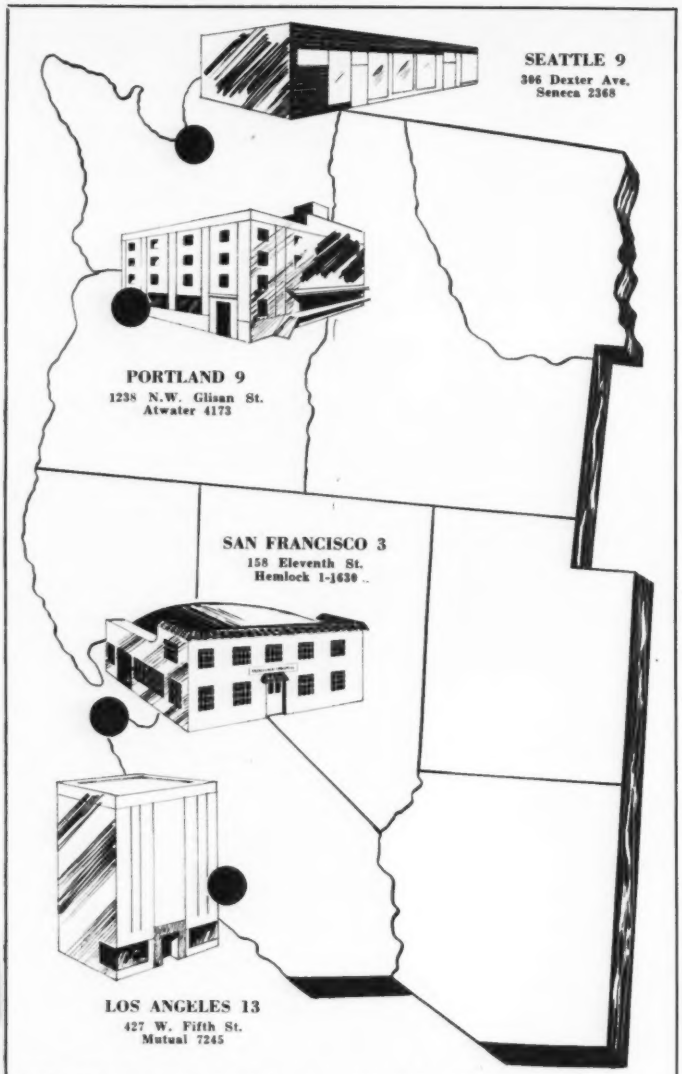
C. Provides excellent seal against water... lubricates efficiently in slight moisture.

CALOL

STANDARD TECHNICAL SERVICE checked this product performance. If you have a lubrication or fuel problem your Standard Fuel and Lubricant Engineer or Representative will give expert help; or write Standard of California, 225 Bush St., San Francisco 20.

Trademark "CALOL" Reg. U. S. Pat. Off.

STANDARD OIL COMPANY OF CALIFORNIA



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(20) **FIRE EXTINGUISHER**—A 1-gal vaporizing liquid fire extinguisher, the Air-Flo, is offered by the Buffalo Fire Appliance Corp., Dayton, Ohio. Large, dual air pumps build up internal air pressure that instantly forces the liquid out in a continuous steady stream up to 30 ft.

(21) **FITTING**—Vap-Oil-Tite, made by Simplet Electric Co., 3602 Potomac Ave., Chicago 51, Ill., is a liquid and vapor tight positive ground fitting used to connect synthetic covered flexible metallic conduit for machinery and equipment wiring. It is recommended by the manufacturer where water, oil, chemicals, grease, etc., are present or where small movements and hard to reach places are factors. It comes in sizes from ⅜ in. to 2 in.

(22) **PIPE FITTINGS**—The pipe point and cap introduced by Gedney Electric Co., RKO Bldg., Radio City, New York 20, fit ¾-in. conduit or water pipe. The pipe point is a rugged conical wedge claimed to penetrate any normal type of ground readily. The pipe cap is a sturdy cover used as the striking surface at the top of the pipe and to protect the pipe from flanging and other damage.

(23) **AIR CONDITIONER**—The 8-ton SU-81 is the largest self-contained air conditioner in the Westinghouse SU Unitaire line of within-the-space conditioners. It is designed for homes, factories, offices and commercial establishments. Westinghouse Electric Corp., Sturtevant Division, 200 Readville St., Hyde Park, Boston 36, Mass.

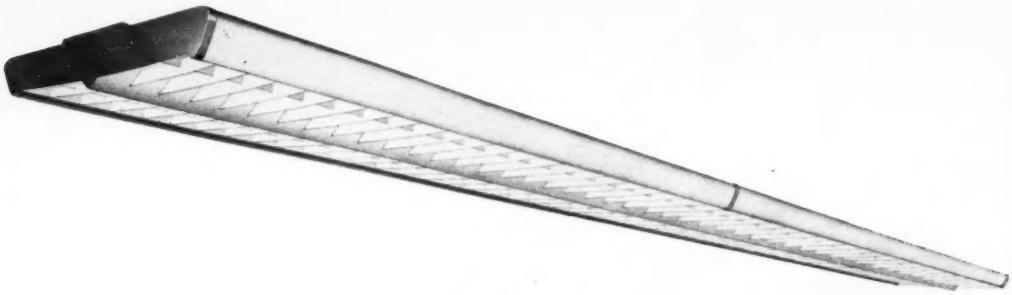
(24) **DRILL GUN**—The Desoutter portable electric drill gun DG45 is geared down to a low 450 rpm, has a capacity of 5/16 in. in steel and ⅝ in. in wood; weight 3 lb. Made by Newage International Inc., 235 E. 42nd St., New York 17.

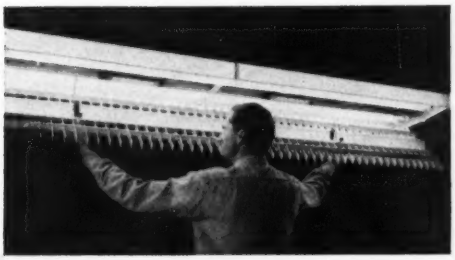
(25) **MAP STICK**—A plastic map stick for maps, tracings, drawings and blueprints is available from the Ross-Martin Co., Tulsa, Okla. Sheets snap on sticks without tools, nails or glue by means of curved plastic grippers.

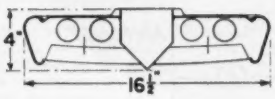
(26) **PAINT REMOVER**—A new model electric paint remover offered by Luro Products Inc., 5501 Denison Ave., Cleveland 2, Ohio, has a double-action scraper consisting of a machined scraper heating element and a cold scraper that also acts as a rest for the tool when not in use. Underwriters' approved.

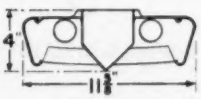
(27) **TIMER**—A multiple-circuit cycle timer has been announced by the Zenith Electric Co., 152 W. Walton St., Chicago 10, for laundry and dry cleaning operations, electrical display signs, industrial furnaces, appliances, etc. It may be set for on and off periods with as many circuits as desired. It can be furnished without synchronous motor for elevator control, limit switch and similar applications. Bulletin 142 gives details.

(28) **CAPACITORS**—Low-voltage photoflash capacitors claimed to maintain their original capacity value after several hundred thousand discharges are offered by Cornell-Dubilier Electric Corp., South Plainfield, N. J. This is a special line of electrolytic capacitors developed for firing No. 5 or similar flash lamps with small dry batteries. They are rated from 25 to 150 v and have nominal capacitors from 40 to 250 mfd.



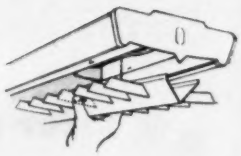


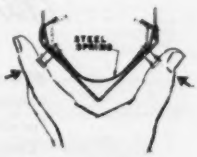




FIRST AID FOR MAINTENANCE MEN

When the lights go out...in a modern luminaire... and they do it seems, about every four thousand hours or so...is when the in-built quality of a well-engineered luminaire comes to the rescue of the maintenance crew. In a hundred, or five hundred or thousand fixture installation (quite common these days), tired, worn out, and dusty lamps can keep a maintenance crew hopping all year 'round...as in all SUNBEAM visionaires the 1280 series illustrated here incorporates just the devices the maintenance man needs to aid in servicing and cleaning. Finger actuated releases, a one-piece eight-foot louver and snap out type plastic side panels are just a few of the many servicing features *designed into* this new visionaire...now available in all lamp lengths and milliamp ratings in two and four lamp widths...for complete information write...





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All Central Conduit is approved by Underwriters' Laboratories and the National Electrical Code. It is easy to cut, bend, and run, easy to fish through . . . and is the result of Spang's 111 years of tubular manufacturing experience.

Your supply house may have difficulty meeting the huge demand for Central Conduit . . . but they are earnestly trying to fill orders fairly, and as quickly as possible.

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SPANG-CHALFANT

Division of The National Supply Company

GENERAL SALES OFFICE: Grant Bldg., Pittsburgh, Pa.

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BULLETINS ETC.

(29) INSULATION—A revised edition of its catalog, "Varnished Insulation and Insulating Varnishes," has been issued by Irvington Varnish & Insulator Co., 6 Argyle Terrace, Irvington 11, N. J. This catalog gives technical data and application information on the manfacturer's line of insulating materials, including AIEE classes A, B and H. Products listed include varnished insulation in yard goods and tape forms; slot insulation; varnished tubing; extruded plastic tubing and tape; wire markers; insulating varnishes; class H insulation.

(30) POWER FACTOR—A power factor visualizer that gives a simple explanation of the use of capacitors in solving low power factor problems is offered by Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. The visualizer (SA-6739) is a slide-rule-type chart. It tells what low power factor is, what it means to the power user and supplier, what benefits can be obtained by improving power factor in the industrial distribution system through installation of capacitors.

(31) CLAMPS, FITTINGS—A 12-page catalog on hose clamps, tools and fittings is offered by the Punch-Lok Co., 321 N. Justine St., Chicago 7, Ill. It describes and illustrates the Punch-Lok method and its applications; lists standard items available.

(32) INSULATION—A four-page folder on Superex block insulation has been prepared by Johns-Manville, 22 E. 40th St., New York 16. Properties are listed, conductivity and heat loss graphs and a recommended thickness table are included. Special shapes in which Superex can be furnished are shown.

(33) MOTOR PROTECTION—Coordinated protection, including protection of circuits, motors and personnel, is explained in a 12-page high-voltage combination-starter booklet, DB-4673, available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

(34) HOME PLANNING—"Electrical Planning for the Modern Home" is the title of a booklet offered by Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa. Taking as its theme, "Plan, Equip, Promote and Sell," the booklet shows electrical planning ideas for kitchen, laundry, lighting, heating and wiring. Also included is a section on planned health features in the home.

(35) INSULATION—A new series of product bulletins on heat-resistant class H silicone electrical insulation materials has been published by Electrical Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill. They are: No. 250, Dieflex silicone varnished or saturated glass tubing and sleeving; No. 400, Imcor silicone-treated glass tying cord; No. 511, Macallen silicone bonded mica segment plate; No. 527, Macallen silicone bonded flexible mica; No. 680, Dow Corning silastic tape type R; No. 680A, Dow Corning silicone varnishes for impregnating electrical equipment and other insulating materials; No. 750, Vartex silicone resin coated glass cloth and tape for applications requiring flexibility and conformance to irregular surfaces; No. 800, insulation classes.

To secure these Bulletins, fill in coupon on Page 58

Use this coupon if: (1) you have a problem; (2) want to ask a question; (3) want to comment on any department in the magazine; (4) have a "gripe."

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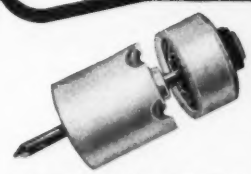
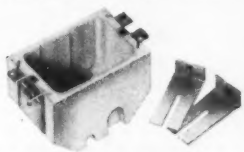
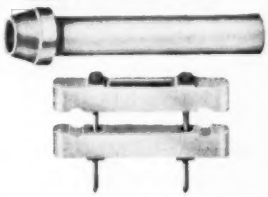


Dense, good looking, positive gripping ALLIGATOR Nail Knobs are preferred by electricians insisting on workman-like installations to build good-will and repeat business.



Outlet boxes with Adjustable Metal Mounting lugs and set of Hangers are nationally famous for durability, ease of installation and safety features.



A complete size range of tubes as well as 2 and 3 wire cleats are available for immediate delivery. Made precisely to give long and satisfactory performance.

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The growing interest in shop testing of service meters indicates that *now* is the time to re-examine your test equipment and procedures. Maximum efficiency and maximum accuracy are assured only when modern laborsaving equipment is combined with the most accurate standard. The accuracy of your service meter testing can be no better than the accuracy of your rotating standard.

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Build *your* modernization program around this standard of accuracy—the Sangamo Type J Rotating Standard. Specific technical information is given in Bulletin 290. Write for your copy today.

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(The Standard of Accuracy)

Straight line load curve on all current ranges.

Thermal current carrying capacity to 200% load.

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Available in 1, 3, 4 or 5 current ranges.

The above close-up shows the unique arrangement used by the Southern California Edison Company. The Sangamo Type J Rotating Standard is mounted horizontally behind a panel with a combination of mirrors to provide for maximum ease of reading. The large photograph shows their very modern Meter Testing Department.

Sangamo J Meters

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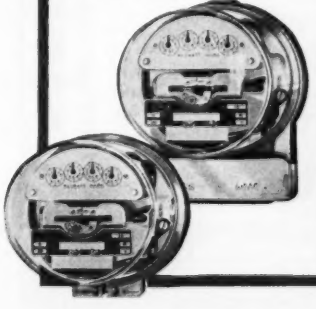
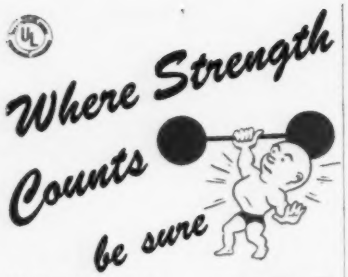


SANGAMO ELECTRIC COMPANY

SPRINGFIELD, ILLINOIS



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(36) AIR CONDITIONING—A 20-page planning guide for industrial air conditioning presents the functions such a system should perform, what to expect from air conditioning and factors to consider in planning types for specific uses. Booklet B-5160 is published by Westinghouse Electric Corp., Sturtevant Division, 200 Readville St., Hyde Park, Boston 36, Mass.

(37) WIRING AND LIGHTING—Catalog 18 has 40 pages of illustrations and descriptions of more than 75 wiring devices and incandescent lighting fixtures manufactured by John I. Paulding Inc., New Bedford, Mass.

(38) AIR CLEANER—Air cleaning units for factories, stores, offices and homes are described in an 8-page leaflet, SA-6691, from Westinghouse Electric Corp., Sturtevant Division, 200 Readville St., Hyde Park, Boston 36, Mass. The Precipitron electronic air cleaner is explained in nontechnical language.

(39) TESTING INSTRUMENTS—A new data sheet, 26-43, on two "Vibroground" Ground and Soil Resistivity Testing Instruments is available from Associated Research Inc., 3758 W. Belmont Ave., Chicago 18, Ill.

(40) INSTRUMENT — Model 292 Capacitrol, made by Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill., is described in bulletin 292-1. It presents the design, used for measurement and automatic control of temperatures on any type of heating equipment. A separate price list includes a listing of standard-scale ranges.

(41) EQUIPMENT—The L & R Mfg. Co., Arlington, N. J., has issued a new catalog illustrating and describing its lines of precision equipment for small parts manufacturing and maintenance.

(42) ALLOYS FOR APPLIANCES—Underwriters' Laboratories Inc., 207 E. Ohio St., Chicago 11, Ill., has prepared a Bulletin of Research, No. 45, entitled "A Determination of the Acceptability of Magnesium Alloys as Enclosures for Portable Electrical Appliances." The result of the investigation indicated untreated magnesium alloys for use as enclosures for portable electrical appliances would be acceptable under certain conditions. These limitations provide reasonable factors of safety for general purposes.

(43) TRANSFORMER—Application of the CSPR power transformer as a packaged, single-feeder substation is described in a 16-page booklet, B-4692, published by Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

(44) AIR COMPRESSOR DRIVES—Up-to-date information on motor drives for all types of large air compressors is included in the E-M Synchronizer, No. 32, prepared by Electric Machinery Mfg. Co., Minneapolis 13, Minn.

(45) COMPRESSORS—Detailed description of the 2-, 3-, 5- and 7½-hp refrigerator compressors and condensing units is given in Bulletin DB-101-110, Westinghouse Sturtevant Division, 200 Readville St., Hyde Park, Boston 36, Mass. Types CLS-74, -110, -188 and -288 are featured.

(46) SWITCH—An 8-page bulletin on its new 600 manual starting switch for fractional horsepower motors is offered by Allen-Bradley Co., Milwaukee, Wis. Installation photos, dimensional and engineering data and features are given for each of the six models and a variety of standard enclosures for all service conditions. Among the switches shown are a key operated model for open and closed types, to prevent unauthorized operation, and special enclosed models for hazardous locations.

(47) HEATING UNITS—A 20-page manual issued by Tuttle & Kift Inc., 1823 N. Monitor Ave., Chicago 39, gives information on the TK monotube surface cooking unit line. This line has been improved so that units on any range can be replaced by stocking four basic units and nine drip pans. Also included in the manual are full data on TK units for electric water heaters.

ELECTRICAL WEST
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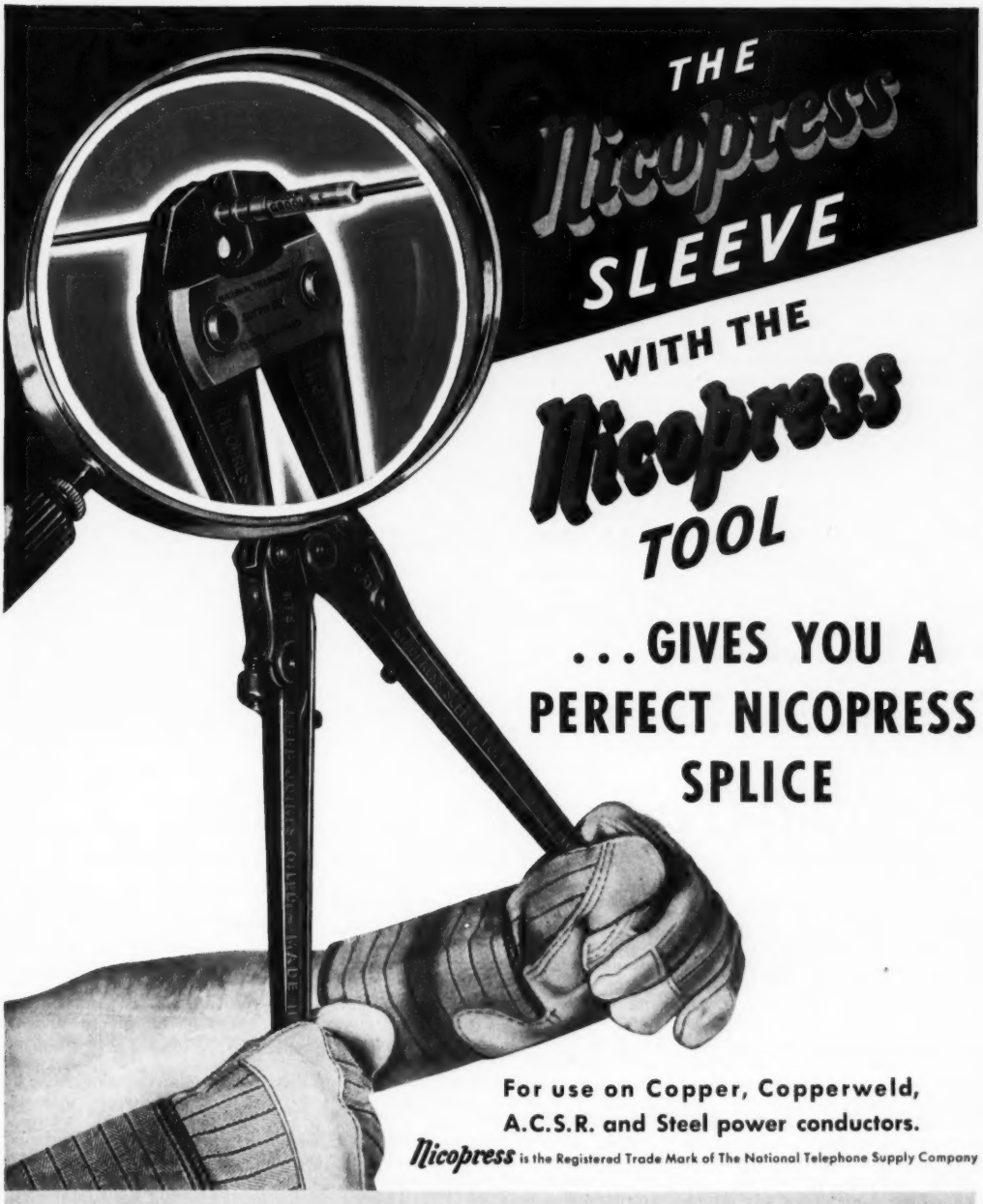

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ELECTRA'S HUSBAND

THE commercial following the Fulton Lewis broadcast had announced that most models and colors of one of the Big Three in the low-priced car field (are there any more low-priced autos?) were available for immediate delivery and that, at most, a wait of a couple of weeks would give the customer his choice. Electra switched off the radio and turned to our guest and asked:

"What's happened to the widely advertised shortages? Dealers are almost ready to give away television sets. Stores are full of refrigerators and washers. Every day the papers announce sales of sheets and towels and shirts and suits. One of the girls in Magnin's says that all of the sales people must take from five weeks to two months' vacation this year because business is so slack. Things like that make one wonder if the country is headed for a bust."

"It's not quite as bad as that," our guest commented. "As a matter of fact it is probably only the lull before the storm. By fall people will be clamoring for the things that seem so plentiful today."

"Have any of your friends tried to buy a clothes dryer or a freezer?" I asked Electra. "There are a couple of items that are scarce."

"You keep out of this," she commanded brusquely. "I can buy those white shirts you had me hoard for six dollars a dozen less than they cost back before Christmas." Turning to our guest she said, "Go on."

"There are some soft spots," he continued. "The wave of panic buying has receded because the public quickly learned that the American productive machine could turn out goods at a faster rate than anyone ever dreamed. Dealers and distributors have big inventories. However, with the exception of television and textiles there hasn't been any dumping. Credit is tighter.

"But the important thing is that the nation's paycheck is increasing at a rate of $2 billion per month which should be enough to perk up retail sales and reduce inventories. The big thing to remember is that durable goods production—automobiles, appliances and things like that—really is going to be cut back severely before the end of the year. If people want to buy consumer goods at the 1950 clip on top of $24 billion of business capital expenditures and a $50 billion military program, that spells inflation to me."

"You didn't make any mistake in buying the shirts," I said to Electra. "There will be a shortage sooner or later. And if there is to be more inflation, that means prices will go up again."

There was a momentary break in the conversation. Our guest grasped the opportunity to expound a thesis which I knew was close to his heart.

The West's Stake in Today's Development

"We folks here in the Far West and especially those in the electrical industry have a great stake in today's developments. That $24 billion of capital expenditures by industry can boost our economy if we get our share of it. But the big thing to recognize is the type of production job involved in the 1951 defense program. Requirements are largely concentrated in four types of products—aircraft; trucks, tanks and other vehicles; electronic devices; and ammunition.

"But the fast growing complexity of these products makes production problems much more complex than they were in World War II. Today's jet fighter is almost as far removed from a P-40 as a P-40 was from the Wright brothers' plane. Why, the electronic equipment alone in some of today's planes costs more than did the corresponding plane of 1944. Today's planes are twice as heavy and twice as complex as their World War II counterparts. That means four times the man power to produce them. And it means much more engineering too. Down at Lockheed they are finding that the engineers put in one hour for every four that the factory people put in. Back in 1945 it was one to ten.

"The apparent aim of the Air Force is to build up a plane capacity of 50,000 units per year. However, production is only set for 15,000 units a year. You can see what that means to the electrical business and to us here in the West. More and bigger factories with many more electrical machines. More work for our electronic plants. More skilled workers. All of which means more electric power to be consumed, and more electric generating capacity."

"You certainly are enthusiastic about this region," Electra commented.

"Why not?" our guest countered. "I was talking to a chap who had made a quick survey of the industrial potential for the Western states. For California alone there is upwards of 1½ million kilowatts of new industrial load in blocks of 500 kw or more planned for 1951-52. There is another half million for the Pacific Northwest and almost half that much for the Mountain states. Two and a quarter million kilowatts of new industrial capacity is a sizable slug. But there is a reason for this expansion.

"One of the outstanding characteristics of the mobilization program is the emphasis on building new plants and equipment. We are making matériel to supply a modern Army, Navy and Air Force of perhaps four million men, as well as to supply our allies and build up a reserve. But we are setting up the plants that could quickly provide the production needed to maintain an all-out defense effort with 12 million men or more in service.

"In fact we are investing more in new plants and equipment than we did in World War II. The steel industry's program alone is almost twice the size of World War II."

"Over-all, this program will have a much smaller impact than did the last war. As planned now, it will only absorb about 20 per cent of the country's total production. Last time the war effort took 45 per cent at its peak. Of course if we suddenly woke up some morning to find ourselves in a full-fledged war with Russia, the picture would change quickly."

"Let's talk about something else," Electra interrupted. We did.

Southern California Edison Stabilizes Transmission System

With Allis-Chalmers Hydrogen-Cooled Synchronous Condenser

THIS 40,000/16,800 KVA HYDROGEN-COOLED SYNCHRONOUS CONDENSER supplies reactive kva to regulate voltage and stabilize the far-flung transmission lines of Southern California Edison. It is one of several similar Allis-Chalmers machines built and building for large power systems with relatively long transmission lines. All are custom built to fill system requirements and incorporate proven Allis-Chalmers features which assure long service life and low operating cost.

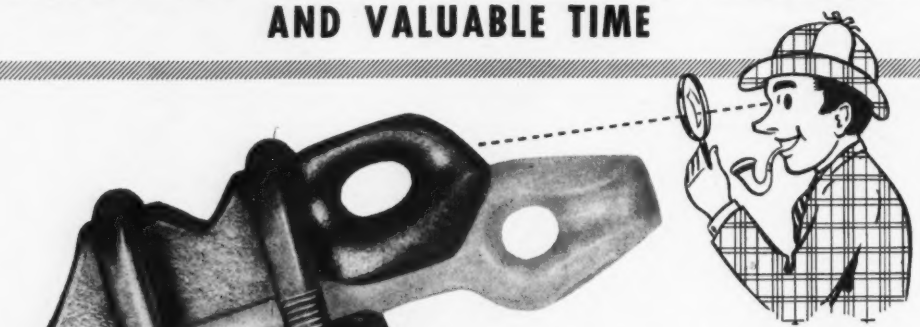
Whatever problem you may have in electrical power generation, distribution, control or regulation, your Allis-Chalmers representative can help you. For further information on Allis-Chalmers synchronous condensers, write Allis-Chalmers, Milwaukee 1, Wis., and ask for Bulletin 05B7285. A-3345

ALLIS-CHALMERS

THIS "PRIVATE EYE" HAS DISCOVERED

MIF AUXILIARY EYE

SIGNIFICANT SAVINGS OF CRITICAL MATERIALS AND VALUABLE TIME



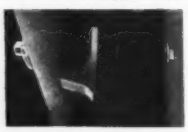
The M.I.F. Auxiliary Eye can be secured directly to a ⅝" or ¾" thimble or oval eye anchor rod to provide an additional eye for another guy, either permanent or temporary, or to serve as a purchase for pulley blocks. Where the strength of the existing anchor rod and capacity of anchor are adequate, the use of the Auxiliary Eye eliminates costly digging and saves critical material and valuable time. Castings are malleable iron, U-bolts high strength steel—all hot dip galvanized.

Other M.I.F. Specialties That Save Critical Materials Or Valuable Time!

By using Williams Pole Mounts where pole butts have rotted, the service life of wooden poles can often be doubled. Salvaging the sound portion of the pole eliminates costly change-over time. For new construction through wet or rocky terrain, the use of Williams Pole Mounts assures maximum pole life. They also add 6 to 10 feet to the effective height of a pole on a new installation.

The Jenne Safety Guy Strand Holder offers the safest and most economical method of handling guy strand. Once in the holder the coil cannot go "wild," thus eliminating a hazard to both lineman and passing traffic. The strand pays out from the center and will uncoil only when pulled. No attention is required at the holder. Weighing only 11 lbs. and available in several sizes, the Jenne Holder can readily be carried to the job. It can also be mounted on a bracket on a line truck.

M.I.F. Crossarm Gains, combined with M.I.F. Washers of suitable size and strength, afford an efficient, economical method of securing round arms on H-frame structures. M.I.F. Gains serve both as supports and transition pieces. Arms can be ordered pre-drilled and creosoted thereby eliminating costly on-the-job spotting and drilling of holes since the through bolts always pass through the diametric center of the arm. M.I.F. Crossarm Gains provide effective support even when arms are out-of-round.



By using M.I.F. Transformer Plates, transformers with suspension hook mountings may be converted readily for through bolt attachment. They eliminate expensive crossarm or doublearming, allow the use of serviceable old transformers interchangeably and give greater security against dislodgement—also permit interchangeability with new transformers fitted with standardized support lugs. Plates are used in sets of twos.

MIF

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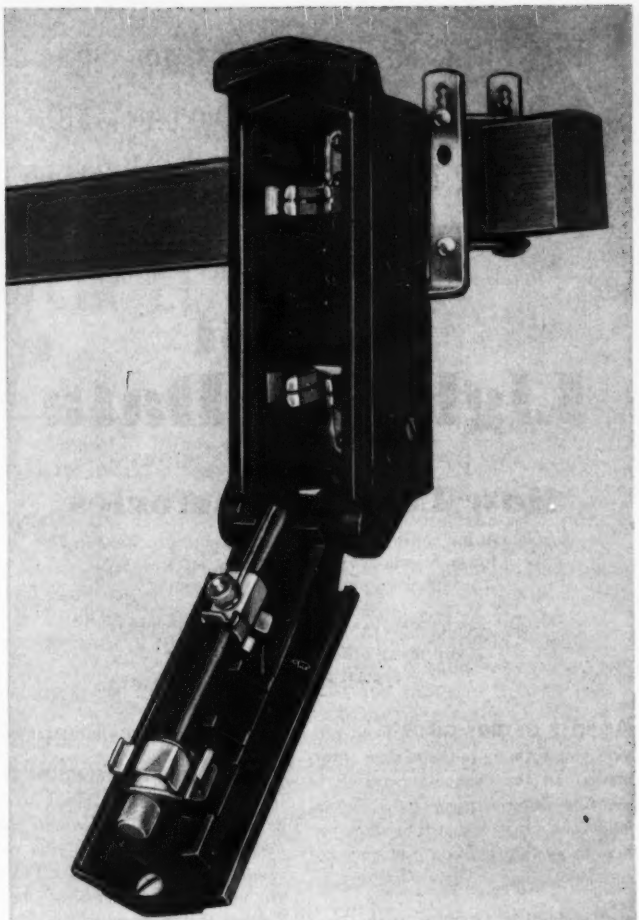
For fusing and disconnecting, this is the most cutout for your dollar

This G-E nonindicating fuse cutout is the most reliable of all porcelain enclosed types. It costs less to maintain. With practically no moving parts, it is the sturdiest cutout built. And you stock fewer replacement parts since all contacts, fuse holders, and other items are interchangeable with G-E cutouts manufactured during the last 24 years.

So—unless you have banked secondaries or other conditions that make indication necessary—this is the cutout to use. It's the lowest-cost all-round cutout providing for fuse holder or disconnecting blade.

Stocked in 50- and 100-ampere sizes, in both 5.2 kv and 7.8 kv ratings. For details contact your G-E Apparatus Office. *Apparatus Department, General Electric Co., Schenectady 5, New York.*



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MECHANICALLY—Housing is of wet-process porcelain glazed inside and out. Door is of Textolite*. Double interlocking barriers between contacts. Hanger cemented to housing permits vertical, tilted and swivel positioning.

ELECTRICALLY—Generous size of contacts, which are self-aligning, provides liberal contact area. All contacts are silver-plated.

FUNCTIONALLY—Provides positive full-range current interruption. Fuse holder is isolated from contacts in housing when door is open. Fuse holder (or disconnecting blade) cannot be placed in cutout door incorrectly. Permits easy and quick replacement of blown fuse.

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32 PAGES OF THE

Latest Lighting Data

AND OVER 50 ILLUSTRATIONS SHOWING

How Leading Factories

are obtaining more production . . . greater precision . . . fewer rejects . . . lower accident rates . . . higher employee morale through the use of the 12 BASIC BENJAMIN LIGHTING SYSTEMS and many other lighting units for special applications

PURPOSE OF THIS GUIDE is to provide you with up-to-the-minute information on the elements involved in securing *better lighting for industrial production*. It is designed to show you how to analyze lighting problems and serve as a guide to their solutions.

THE GUIDE TELLS YOU HOW Benjamin Lighting Specifications can be applied today . . . under today's conditions . . . *to meet today's production problems*, today's need for greater use of floor areas and today's problems of installation.

12 BASIC BENJAMIN LIGHTING SYSTEMS and many specialized lighting units to help solve production problems, are recommended by Benjamin. These Systems are the result of *50 years of specialization* in the lighting of all types of factories, large and small. Included are those engaged in the manufacture of essential goods, such as aircraft, guns, ships, tanks, powder, ammunition, chemicals, clothing, food, etc.

IMPORTANT INFORMATION is also included, concerning recent Benjamin developments which *facilitate maintenance, cut operating costs* and *provide sustained lighting efficiency*. Covered are such advancements as the new "Magna-Flo" Systems which utilize the new Slimline Fluorescent Lamps; "Springlox" Lampholders, which speed up fluorescent lamp maintenance; and "Turnlox" reflector equipment, which promotes simplified maintenance of incandescent units.

THE GUIDE IS WRITTEN for the busy industrial executive, engineer, foreman, architect, and all others concerned with the planning, purchasing and installation of industrial lighting equipment in plants engaged in essential production. For your free copy, sent without obligation, write today to BENJAMIN ELECTRIC MFG. CO., DEPT. J DES PLAINES, ILLINOIS.

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How to analyze present lighting
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Please send, without obligation, the FREE GUIDE to IMPROVED PLANT LIGHTING, containing up-to-date information on how to solve defense production problems by the application of latest lighting practices.

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JUNE 1951 Vol. 105, No. 6

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

A PLEA FOR LEADERSHIP

HISTORY shows that every major crisis develops strong, responsible leadership. For the second time in a decade the national and international situation is putting a great strain upon the leadership of America. As a nation we are again forced to mobilize to repel the threat of aggression. If leadership is lacking on the political and diplomatic fronts of the nation, it is well for the country that a high caliber of leadership performance is being developed on the industrial levels. Ours would be a sorry future were it not for that fact.

The electrical industry can take pride in its superlative record of leadership. It demonstrated its ability in World War II by delivering whatever was needed whenever needed. It will exceed that performance in the present emergency because of the attributes of its leadership. Some might well ask what are these attributes? They are characteristics that are common to leaders everywhere.

Leadership demands a knowledge of the job to be done and a willingness to work at the job. Leadership involves forward thinking and planning—a degree of initiative which the electrical industry possesses in abundance. It demands aggressiveness even in the face of seemingly insurmountable obstacles. Leadership requires a deep understanding of people and it demands the ability to delegate responsibility. It involves conviction—an unshakable faith in the future. It demands an attitude made up of conviction, enthusiasm and optimism. Someone has said that leadership basically is the ability to see and know the right thing and to do it without regard for the consequences. All these are attributes of the electrical industry.

Our industry knows too that the rewards of leadership are widespread recognition, public acclaim and a profitable enterprise. It recognizes too that leadership prompts envy that would destroy it. Experience has taught it also that leadership can bring self-satisfaction that ends in mediocrity.

Is it asking too much of those who guide the destinies of this nation to display some of these same leadership qualities that our industry possesses? We need right now a national leadership dedicated to the task of getting our mobilization job finished without wrecking the country's economy. We need a leadership that knows that our victory can only be final and complete when the forces of Communism are crushed. We want a type of leadership that admits of no compromise with this goal.

The nation needs leadership that will be vigilant against the encroachment of our freedom and our liberties, because we know from sad experience that a taste of the power that goes with public office—especially in emergencies like the present — frequently only serves to arouse an insatiable appetite for the cloak of the absolute dictator. To finish today's task only to find that we have lost our liberty and freedom would be too dear a price to pay.

May we not ask of our leadership these things: An assurance of political, economic and social freedom. A recognition of the human values and relationships of life. And a guarantee of spiritual privileges. With that type of leadership on every level in this country we cannot fail. Without it, we may not succeed.

George C. Tenney

EDITOR

In the power-short Pacific Northwest where federal projects seem to hold the spotlight municipal and private companies will build 2,200,000 kw of new capacity in the next five years. THOMAS W. DELZELL, NWEL&PA president, says

The need is great for

A FAIR FEDERAL POWER POLICY

Thomas W. Delzell is president of the Northwest Electric Light & Power Assn. and chairman of the board of Portland General Electric Co. He has worked diligently for a workable relationship between the utilities and the federal government

DURING the past decade the production gears of American economy have been shifted from peace to war to peace, and now in 1951 we are in the intermediate stage of war again. Once again defense mobilization has become industry's primary concern; and electric power is a vital component part of the effort.

The Pacific Northwest and its great blocks of power played an important role in production for World War II. The responsibility is here again, superimposed on a civilian economy that has known phenomenal population and industrial growth during the past five years.

The Columbia River and its tributaries are producing far more power today than at any time during World War II. Hundreds of thousands of kilowatts, public and private, have been added to the Northwest Power Pool in the postwar rush of regional expansion. But the fact is that, as this new generating capacity has been brought onto the line, it has been absorbed quickly and completely by the region's steadily increasing appetite for power.

So it is that until a large amount of additional capacity is provided, the region will not be able to handle more than a limited amount of new war load. For at least the next two or three years, until large new blocks of power are available, we shall be facing the possibility of deficiency and consequent curtailment, and will be more than ever dependent on good stream flows to take care of existing loads.

The big federal dams—McNary, Hungry Horse and the last units at Grand Coulee—will of course be rushed to completion; but other federal projects still in blueprint form cannot be built quickly enough to satisfy our immediate need. Thus, *all* utilities in the region—municipal and private as well as federal—must be put on a high priority to develop new power wherever possible.

At the Monday afternoon panel session of the Business Development Conference in May, utility members of the association illustrated their readiness to meet the challenge when they outlined individual programs of system growth over the next five years. With an expenditure of well over half a billion dollars, the private companies are prepared to bring 1,446,000 kw of power into production up to the end of 1955. Add to this the plans for development of up to 765,000 kw by municipal systems during the next two or three years, and the non-federal total becomes impressive.

However, there are a good many hurdles to be jumped before all of this new generation becomes a reality. Hundreds of thousands of potential kilowatts are being delayed by political controversy, pointing up the fact that a well-defined policy governing federal participation in hydroelectric development is long overdue. Specifically, the line of demarcation between federal and local participation should be fairly drawn to encourage immediate and long-term development of water resources on the local level. This was true during the postwar period of civilian expansion and is intensified by the incremental requirements of defense mobilization. Although federal development of multiple-purpose projects has long since become an accepted fact in the Pacific Northwest, it does not follow that because the federal government does part of the job it should do it all. Indeed, government monopoly of our power supply would be far more dangerous than the malpractices of the utility combines at their worst.

The need for a fair and equitable federal policy is immediate and great, to the end that the citizens of this region be economically and efficiently served and the legitimate requirements of defense mobilization met—without any accompanying forfeiture of traditional rights to federal domination. But in the meantime, regardless of differences of economic, political or ideological opinion, the responsibility is upon us; and the proven medium for cooperation in meeting the responsibility is the Northwest Power Pool, with nine years of experience behind it.

The pool was established in 1942 as a war measure to conserve and make use of every kilowatt of power produced in the generating plants of the region. It has been an outstanding success, its value increasing as new generating capacity is added, its importance intensified during the postwar period of tight power supply. The interconnected federal, municipal and regulated-utility systems that make up the pool have achieved wonders in the saving of kilowatts and dollars. Just as important, there has evolved from the years of pool operation a greater degree of unity among these various segments of power industry, affording at least a common ground for continued discussion of the controversies that must be resolved.

It's the know-how or intimate knowledge of the men and women in every branch of the electrical industry, says FRANK TRACY, president of of the PCEA, that should convince any and all that in this national emergency . . .

The electrical industry

IS PREPARED TO SERVE

Frank A. Tracy is president of the Sierra Pacific Power Co. as well as president of the PCEA. An electrical engineer originally, he has been an operating executive of utilities in Canada and in the West Indies as well as in the United States

THE electrical industry, as a whole, is prepared to serve to a degree never before possible. Manufacturers, wholesalers, distributors, dealers, contractors and utilities are all united for the common good of the industry and are ready for the job of producing for a war economy as well as a civilian economy.

Leaders of industry learned much during World War II, which should now be of real assistance to them. They should be able to convert from a full-scale civilian economy to a partial war economy with not too great an effect upon the civilian requirements. Our industries, which began huge expansion programs during the mid 1940s, are now in a position to utilize their full capacities. It has been said that in World War II the products of our electrical industry were never too little or too late for the war effort. If it were true then, it certainly will be true now, notwithstanding the numerous problems facing us today.

It is not my intention to present volumes of statistics to prove that the electrical industry is better prepared to serve in both the war economy and civilian economy than ever before. It it not my intention to dwell upon the fact that this nation could never win a war without the products of our industry—nor that the world could ever attain peace without them.

All of you will recall how, toward the close of World War II, we worried about excess productive capacity that we expected to have after it was over. We were certain that we would have idle capacity regardless of the fact that, as we expanded for the war effort, all leaders of the industry were busy with future planning, aimed at keeping their facilities operative to produce for civilian consumption following the war. We all know that it was our great American way of life—the increased spending power of the people resulting in improved standards of living—that solved the problem for us.

It is my belief that it is the know-how of the men and women in the electrical industry that makes this industry ALWAYS prepared to serve.

Know-how—inventive genius—together with an everlasting determination—can accomplish what might seem to be the impossible.

It is the know-how that makes it possible for us to surmount our difficulties and to solve the problems that confront our industry.

Knowledge is nothing but retained or accumulated experience. In schools and colleges, experience of others is imparted to us. In everyday business activities, knowledge is gained from experience of others and from our own initiative and inventive genius. Individual initiative has full sway under our free enterprise system. Therefore, the American know-how surpasses that of any other nation.

We as individuals are not limited as to the heights that we may reach, regardless of how humble our beginning. He who chooses our industry as a profession need only to accumulate experience while doing the job assigned him and, with the right amount of initiative, the ladder of success will be to him but a stairway to the floor above.

Individual progress is very often a state of mind. An over-ambitious, restless individual, who spends more time thinking about advancement than the job at hand, usually does not make very fast progress. I might amplify this thought further, but I know of nothing that presents the idea I have in mind better than a quotation from a letter written by the personnel director of the Stone & Webster organization at the time I began my utility career and who hired me for my first job. This letter was written to a young man who was in the "state of mind" I have just mentioned. The portion of the letter I want to read is as follows:

> *The way to get ahead in this world is to do anything that is asked of us cheerfully and with all our might, strivjng to make good in it so as to be considered for more congenial work. This is not a sermon but a bit of friendly advice.*

The young man who received this letter changed his method of thinking and put his mind to the task of getting experience on the job assigned him and went on to be the head of a large utility company. By obtaining the know-how this young man brought dividends to both himself and his industry.

Yes, under our system of free enterprise, each of us has the opportunity to "join the parade"—developing the new and improving the old. The parade is the march of civilization and constantly in motion. We have our choice of falling in line with the marchers and becoming one of

them, or of standing by the side of the road—watching the parade go by—possibly never to return.

The march of civilization is progressive. It encounters various obstacles and problems in its progress. Usually, major effects are expended on one problem at a time, which problem is more or less satisfactorily solved before the next one is tackled. This, of course, takes time.

A century ago the main problem to the individual was that of existence. Therefore, his mind was occupied by production. Of course, it had been thus for thousands of years. Man produced to support himself and his family, working from sun-up to sun-down. The wife spun the yarn to make clothing for the family. The children helped in all the effort to survive and little was thought of schooling, as this was most certainly a luxury under the circumstances.

Thus the years rolled by and during this past century industry has "kept in line with the marchers." Inventive genius and initiative knew no bounds during this period, and soon we were producing more of the so-called necessities of life than we could sell and began to produce an abundance of the so-called luxury items, for which we had to create an acceptance before we could sell them. We did such a good job that many luxury items became necessities to our people.

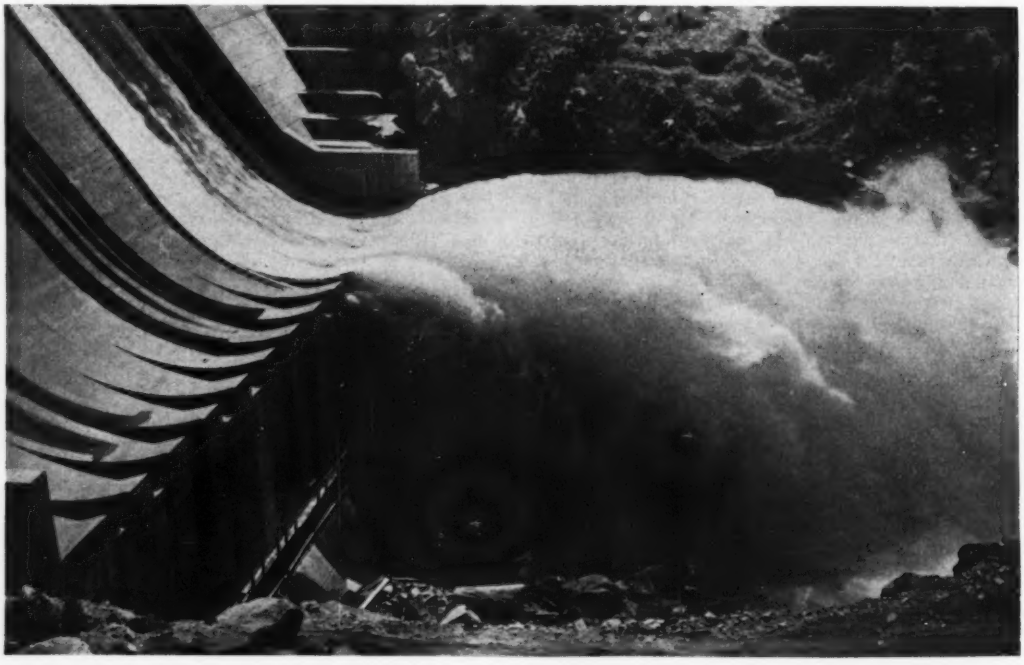
Our country prospered during this time and our schools and colleges flourished. Our standard of living was constantly increasing and soon we found that the old problem of production became one of distribution. At that time we entered the period where real salesmanship came into existence. True, while solving the original problem of production and substituting the problem of distribution, there came a renewed importance of the former. This made for better and more efficient production methods.

Our know-how—the drum major of the parade—created the new articles to sell and the salesmen created a desire in the buyer to buy. Expanded production gave employment to millions and, with the people having the buying power, the salesman really came into his own. The salesman found, however, that to make a sale he did not simply sell the article, but rather he sold the pleasure or the contentment which that article gave the buyer.

Through the years we have gone forward with the parade in the march of civilization. Our industry, as a matter of fact, has led that parade. We have built and expanded an industry that is the backbone of our nation's economy. The pulse of our industry reaches into the family life of nearly every home in America, whether it be in the city or on the farm. Electric power is, in fact, essential to our production whether it be in a war economy or a civilian economy. Without it we as a nation would not be looked up to by the people of the world today as their last hope for peace.

Let's keep our heritage of know-how—train well the young men and women in our industry who some day will take our places. Guard well our way of life—our free enterprise system—for, as long as we have the right to assert our initiative, it will be possible for us to go forward in the future to even greater accomplishments.

We accept this responsibility and will put forth our efforts to do the job. Remember, free enterprise is the foundation of our nation. It was inherited from our forefathers and we must hand it down to our children. Only through this system can we obtain the results from full production, maximum economy, efficiency, ingenuity, individual initiative and abundance.



This spectacular picture shows a new type of energy absorbing apron employed on the gravity-type concrete dam impounding water for the new 84,000-kw Big Creek hydroelectric plant of the Southern California Edison Co. on the San Joaquin River

Industrial planning for the defense program must be thoroughly tied to adequate electric power supplies, says M. C. HEFFELMAN, president of the RMEL. Therefore Mountain States electric utilities are completing tie lines so that

POWER IS POOLED FOR DEFENSE

THE electrical industry might well be said to hold the destiny of our nation in the hollow of its hand. Defense planning, almost in its entirety, is firmly rooted in electrical power. No one is more cognizant of this basic fact than the electrical industry itself. Armament and rearmament, including the production of atomic weapons, is all based upon a foundation of sufficient and dependable electric energy. The area covered by the Rocky Mountain Electrical League could be termed a hot spot in our national defense program, for in this area are some of the largest atomic and guided missile projects.

All branches of the industry in this Rocky Mountain area are working towards a definite defense program and the Rocky Mountain Electrical League is playing a large part in directing and guiding this work. It serves as a clearing house for information invaluable in the national defense program. Many of the member utilities throughout the area served by the league are furnishing skilled and competent men to serve on local or state committees organized by the Civil Defense Administration.

It can be said without fear of successful contradiction that the electrical utilities in the Rocky Mountain area are keeping amply ahead of the current demands for the ever increasing loads developing. And, in addition to new plant capacities, they are working out plans for complete integration of the various transmission systems.

Power pools are the order of the day. Colorado and Wyoming have worked out a plan for a large pool, as have west Texas and New Mexico utilities.

What is probably the largest of the New Mexico-West Texas pools was completed recently between the El Paso Electric Co., the United States Bureau of Reclamation and the Public Service Co. of New Mexico. Construction is now underway on the last lap of the interconnecting lines, which will extend from El Paso on the south to Santa Fe on the north and include the Bureau of Reclamation's hydro plant at Elephant Butte. This reclamation plant is located near the New Mexico city that received so much publicity recently when it changed its name from Hot Springs to Truth or Consequences. While the federal government's great atomic project at Los Alamos, a few miles north of Santa Fe, produces a major portion of the energy it uses, it too is interconnected to the pool and, if necessary, could be supplied entirely from the pool.

The Santa Fe power station of the Public Service Co. of New Mexico recently doubled its capacity and a new power station is now on the planning board for construction at Albuquerque. This will add another 40,000 kw to the pool capacity.

In December 1950 the Colorado-Wyoming pool was formed to work with the Defense Electric Power Administration, on problems relative to the power supply situation in areas served by the interconnected Colorado-Wyoming systems. The principal power producers represented in the organization include the Bureau of Reclamation, Cheyenne Light, Fuel & Power Co., Western Public Service Co., Mountain States Power Co., Western Division of Consumers Public Power District, City of Fort Morgan, City of Longmont, City of Loveland and Public Service Co. of Colorado. All of these systems are interconnected and all have expressed a willingness to cooperate on an informal basis. Several other small producers will probably be connected with the pool when they interconnect with the Bureau of Reclamation's lines. Under present plans the capability of this pool in 1953 will approximate 798,000 kw.

M. C. Heffelman is vice-president in charge of operation of the Public Service Company of New Mexico as well as RMEL president. His entire utility career has been with Southwest utility organizations

While the state of Colorado does not at the present time have any designated critical areas, the Civil Defense Agency has made great strides towards the over-all protection of its integrated system. It was just last month that the first practice "alert" was staged. The alert, although considered reasonably successful, developed several situations that showed the need of improvement. Weak spots were spotted and corrective measures immediately taken.

While several critical areas might exist in New Mexico, the state has not as yet staged an "alert." It is probable, however, that it will as soon as the connecting link in the pool between Socorro and Albuquerque is completed.

The executive committee of the Rocky Mountain Electrical League has authorized the organization to cooperate and assist defense planning in every possible way. The league's manager, Ralph B. Hubbard, has been selected as deputy chief for the Electric Power Division of the over-all utility section for the state of Colorado. Since practically all of the private electric utilities in Colorado, New Mexico and Wyoming, as well as many of the municipal electric systems, are members of the Rocky Mountain Electrical League, it is only reasonable to assume that the organization can assist very materially in the over-all power coordination for the entire area.

The electric utilities of the Rocky Mountain area recognize the responsibilities they face and are planning to stay way ahead of any potential defense developments.

Power capacity of the Pacific Southwest Power Area will double between 1946 and 1954. That means, says D. D. SMALLEY, Pacific Gas and Electric Co. vice-president in charge of operation, that all utilities in this region will be ready to assume their full

MOBILIZATION RESPONSIBILITIES

BASIC responsibilities of electric utilities are quite the same under mobilization as during more normal periods except that the responsibilities are expanded. This industry is so vital to every plan for local and national mobilization of the country resources that it is necessary for us to strain every effort to provide that fully adequate service which will insure success for the plan. In other words, it becomes necessary for the utilities to mobilize their resources fast and to keep ahead of and serve the general industrial program.

The utilities comprising the Pacific Southwest Power Pool have recognized that responsibility and duty. It is well demonstrated by a review of the problems that have been met and solved, and the manner in which this was done.

Prior to 1940 we were serving loads based on agriculture as the most important industry, and we had grown up under the impression that agriculture was our destiny. California was not a heavy industrial state and there was little prospect for any such development. Load factors in 1940 were about 60%. Almost over night we were called upon to serve shipbuilding loads, airplane factories, steel mills, aluminum plants, and all kinds of allied industries, all operating 24 hours a day, seven days a week. We had to find the energy to supply an average load factor of as high as 78% some months of 1944, an increase of 16% in less than four years. Little or no generating equipment was available because everything was needed for industry mobilization and called for in the manufacture of the tools of war.

Fortunately, substantial interconnections were available to permit power exchange between operating companies, and in June 1942 the Pacific Southwest Power Interchange Committee was organized with representation from all the power generating agencies in California, Arizona and Nevada. The pooling of all of these resources made it possible to meet the demands.

The war effort in this area did not suffer from lack of power to serve the factories and shipyards. There was power to run the pumps to lift the water necessary to irrigate the food crops, even though this irrigation load was expanded beyond anything that we could possibly have anticipated.

That power interchange committee continued to function and is still active. It is, therefore, possible to consider the problems of present mobilization with experienced minds. All of the members of the committee are operating men with intimate relationship and mutual understanding of the operating policies and practices and problems of each individual agency. They are acquainted with these matters as they have developed over the years, which is of tremendous value in making plans to meet the present emergency. There has been important exchange of information so that every committee member has knowledge of the scheduled program for new equipment, new resources and new loads.

The postwar load growth in the Pacific Southwest area has been without precedent and we have had a struggle to match the load with adequate resources. Plans and schedules are carefully prepared and if we are allowed by the controlling bureaus and administrations to hold those schedules, we will be mobilized to meet the demands as we see them.

The population of California increased from 6,907,387 in 1940 to 10,586,223 in 1950, a matter of 53.3%. This is the greatest mass migration in the history of the nation, and perhaps in the history of mankind, and they are still coming West. All of these people need places to live and the growth in housing alone is no small factor in load development throughout this entire region.

Fig. 1 is a graphic record of load growth in the Southwest area from 1944 to the spring of 1951. Demand has advanced from a peak of 3,709,000 kw in 1944 to 5,664,000 kw in December of 1950, an increase of 52.7%. The energy demand has grown from 2,108,000,000 kwh in July 1944 to 3,024,000,000 kwh in August 1950, an increase of 43.4%. Note that energy requirements were lower in 1945 and 1946, but in 1947 the curve climbed again and has been increasing in tune with the peak load curve ever since. The load factor curve has stabilized and

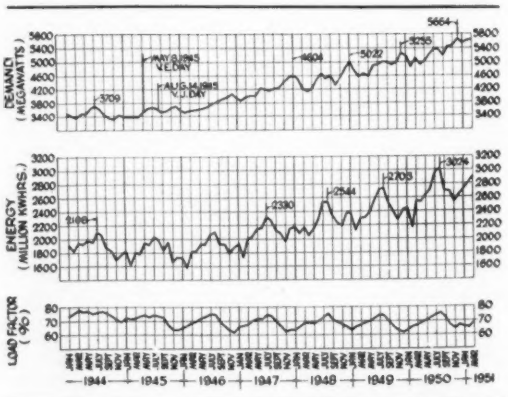


Fig. 1. Annual demand, energy and load factor curves for the Pacific Southwest Power Pool for the years 1946-51 inclusive

Based upon an address before the Pacific Coast Electrical Assn. annual convention, Los Angeles, May 21-23.

you will note that this area enjoys a load factor of 63.5%, which is appreciably higher than most of the rest of the country. The national average is approximately 55%.

How about the future? Estimates must be made of load growth for not less than three years into the future, because at least that much time is required to design, construct, and prepare new generating plants for dependable operation. General national mobilization imposes restrictions on the supply of materials needed for new plants, new lines, and new substations, so schedules may have to be revised and even longer than three years may be needed for the completion of the new facilities.

Fig. 2 shows our estimates of load in the area through 1954. You can see the estimated effect of industry mobilization and we feel that these estimates are realistic and reasonable. This indicates an increase of 100% in demand from 1946 to 1954, or from 4,000,000 kw in 1946 to 8,000,000 kw in 1954. The same ratio obtains for energy, increasing from 22,000,000,000 kwh in 1946 to 44,000,000,000 kwh in 1954. Annual load factors of between 63% and 64% are anticipated. Plans to meet these loads with reasonable margins for reserves and emergencies are approved; orders have been placed, and work is under way.

Fig. 3 shows what expansion of facilities has been accomplished in the area, and what the plans are for the future. This illustrates a most interesting transition in the power development program, showing a radical change from the accepted practices of only a few years ago. Generation in the Pacific Southwest area has been predominately by hydroelectric plants since the earliest company was started, but as present plans are carried forward, steam-electric generation will equal hydroelectric generation late in 1953, and will be the greater resource after that date unless or until major hydroelectric plants are added to the systems. In 1946 hydroelectric plants amounted to 3,285,000 kw, or 66.35%, and steam-electric plants were rated at 1,666,000 kw, or 33.65%. In 1950 hydroelectric plants had increased to 3,917,000 kw, but this was only 55.60% of the total, whereas steam-electric plants had grown to 3,129,000 kw, or 44.40%. In 1954, under the present program, installed hydroelectric capacity will have increased to 4,608,000 kw, but the ratio with steam will have reversed itself and hydro will drop to 45.20% of the total. Steam generation will have developed to 5,584,000 kw, or 54.80%, upsetting the traditional hydro "backbone" of power supply in the area. Although hydroelectric facilities will be less in total capacity than steam-electric resources, they are still a big factor in our electric systems' operation. The addition of major high-pressure, high-efficiency steam plants has lessened to some degree the uncertainty of power supply in years of deficient precipitation and subnormal snow crop.

D. D. Smalley is primarily a utility operating man who has filled virtually every operating responsibility in his company. He was one of the members of the original Pacific Southwest Power Interchange Committee

With total resources of 10,192,000 kw in generating capacity in the area by 1954, we can say with pride that this area is a real factor in the nation's industrial development and is a major contributor to the mobilization strength of the nation. This is an imposing demonstration that the electric utilities have realized their responsibilities and have done a good job. Their record is in keeping with the electrical industry tradition that adequate and dependable service **must** be available as and when required for the full development of all related business. Our plans for the future clearly show that we are ready for the responsibilities that are ahead of us whatever may follow the present stage of emergency mobilization.

All of this has to do with equipment and property, but there are other factors which enter into this mobilization effort. All utilities are taking a very serious view of civilian defense problems and have entered into the security program wholeheartedly. The responsibility of civilian defense strikes home to our industry as a whole. Through the Pacific Southwest Power Interchange Committee there has been excellent cooperation in the exchange of power supply and the information necessary to enable all of us to operate to the best advantage. In the civilian defense program we are working on the basis of mutual aid so as to render the greatest assistance possible each to the other in the event of any emergency or disaster. Plans have been concluded to cover state-wide operation if and

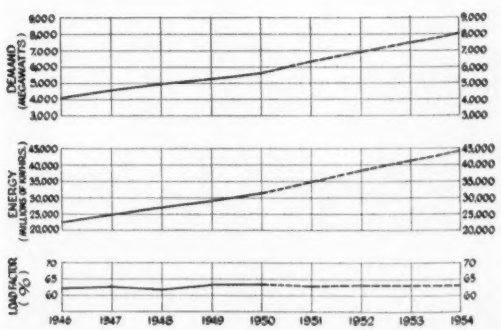


Fig. 2. Monthly demand, energy and load factor curves for the Pacific Southwest Power Pool for the years 1944-1954

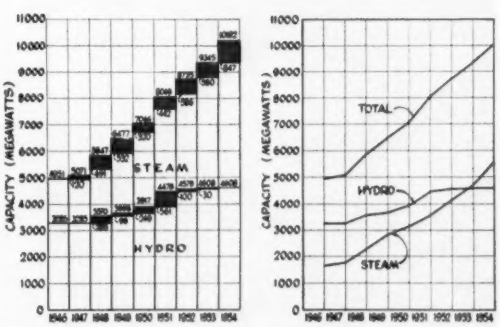


Fig. 3. Installed capacities and authorized increases, both steam and hydro for the Pacific Southwest Power Pool, 1946-54

when that becomes necessary. Your utilities have taken steps to protect their properties from sabotage and any possible overt attack. This is no small program, and it is being worked out with diligence and dead seriousness.

We are faced with the necessity for protection from forces that are largely strange to us. The science of our industry develops rapidly, and as we read various governmental reports we find that the science of destruction has advanced just as rapidly. We are preparing to meet this situation as best we can with the tools and with the information available to us, and with the resources of our common sense and imagination.

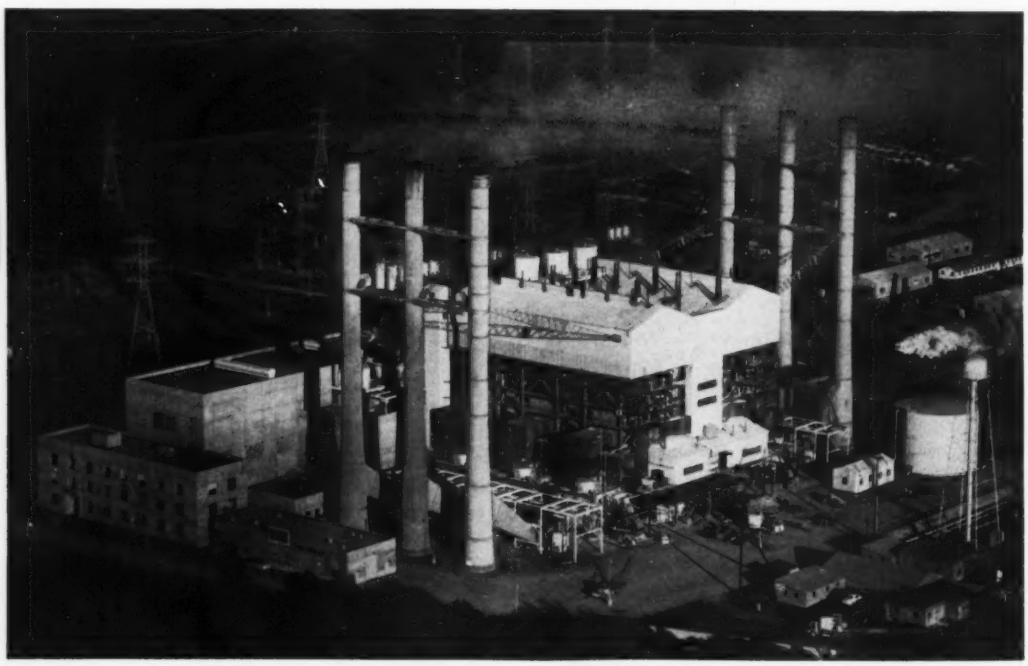
There is another problem that, in my opinion, is of extreme importance. We have talked about mobilization of resources and mobilization of facilities. Thought should be given also to the mobilization of manpower. When we think of mobilization on a national scale, we naturally think of creating armies with all of the various units necessary to support a fighting force, and that deals primarily with personnel. In our industry we have no less a task. A great deal has been said and a great deal has been written about job training, and indoctrination of new employees to fit them for the work they are to do for us. These programs are excellent and the results are reasonably satisfactory.

However, there are many of us, particularly in this industry, who have been raised to have full appreciation of the benefits of private enterprise and its effect on our standard of living. Unfortunately, that is not true of many employees of private industry, particularly among the younger men and women. We can educate our employees to do what must be done with their hands but I believe strongly that we should give more consideration now to an education in philosophy. The young man who comes into our organization today has had no opportunity to learn anything about the advantages of private enterprise except as we demonstrate those lessons of sound economies and practical achievement to him. This is something that we encounter time and again and I believe that it should be approached without any criticism whatsoever of these young people who decide to seek their working careers in our business. The young man or woman who is graduated from college today has spent his or her entire life to date in an atmosphere very different from the one which developed our business.

To me this is the most challenging problem of our time. The industrial might of the private enterprise system, which has made this nation the most powerful in the world and the most comfortable and happy place in which to live, is at stake, but of transcending importance is the tragic fact that the blessings of freedom—our great American heritage—are also at stake in the same pot.

Too many of our young people have been misguided, deceived, and fed with venemous half-truths by the enemies of the American way. The sirens of socialism have so glorified **security** as the goal of life—security by the whim and consuming paternalism of bureaucracy, that is—that the real glamour of the American way—**opportunity**—is in partial eclipse.

We in the electric utility industry have a continuing fight on our hands against encroachment of socialism. We can't afford to relax for an instant. We have been doing pretty well in that running battle, but our victories today will be lost tomorrow unless we look to the future in our philosophical problems as well as in our operating problems.



Aerial photo of Pacific Gas and Electric Co.'s Moss Landing steam plant on Monterey Bay. Initial installation of three 100,000-kw units completed within past year is being augmented by two more units of same size making plant capacity 500,000 kw

Keep socialism at arm's length if you value your liberty, your country or your future, declares OLIVER W. HINDLEY, British journalist. During the years that he has watched the nationalization of British industry, he has concluded that

SOCIALISM IS LIKE A NARCOTIC

BUT recently arrived in this wonderful country of yours, I can speak of things I have seen happen in England in these last few years—slowly and insidiously—at the instigation of the powerful left political movement and with the support of many who ought to have known better. My British instincts tell me that England deserves better than she has received at the hands of the Socialist government, and the hopeful thing to me is that there is now a powerful reverse swing of the pendulum, which cannot fail in the long run to put my country back on the right road.

I understand from good friends here that what I have to say may have a moral in this country—that there are some people here who have a taste for political management of the vast resources of the American continent; that there are more who would support such political management. But nationalization, mutualization, collectivism—by whatever fancy name it may be called—has always failed in the long run to achieve either the purposes which its more starry-eyed sponsors have had in mind or, for that matter, the material results hoped for by down-to-earth socialists.

Perhaps you will bear with me if I start with a brief outline of the industrial and political background in Great Britain before World War II.

Within the bounds of laws enacted by Parliament over many hundreds of years nearly all enterprise was then privately undertaken. Notable exceptions were the postal and telephone services, traditionally run by the state in most countries, and, of course, the armed forces. The civil service was relatively small—less than one per cent of the whole population and about two per cent of the working population. Most of this small percentage was accounted for by postmen and clerks; in other words the drain on trained brains and on the taxpayer's pocket was not great. The civil service represented only a small part of the national housekeeping bill.

Taxes, though high, were supportable, and did not prevent either the citizen or industry from having a strong incentive to make its way in the world vigorously. Nor was the revenue collected by the government insufficient to ensure a reasonably efficient civil service. The lot of the poorer classes was improved by the only means which the engineer will acknowledge—by technological advances in industry and increased productivity. The production of goods rose steadily during those years and inevitably with it the standard of living. It is true that there was no spectacular improvement, but to my mind there was steady progress all around. I hasten to say that I was not so foolish—nor am I now so foolish—as to think that everything in those days was perfect, but it certainly was a paradise compared with what we are up against now!

With the coming of war in 1939, as all of you know, Britain had to give up all her traditional liberties to the great cause. She did this cheerfully, and showed, I think all of you will agree, doggedness and courage which was a shining example to the whole world. For six long years she suffered and toiled, with no other thought than ultimate victory and peace. That story has been told elsewhere and it is no part of my theme to go into it now.

But there is one point that I would like to bring out. During those six years all liberties of the individual were subordinated to the prosecution of the war. Rationing of all kinds was introduced and regulations by the thousand poured out of the governmental administrative machine. Mostly they seemed reasonable and necessary, and nearly everyone accepted them, no matter how much they cut across the ideals of freedom. But after some while Britons became used to these restrictions, and perhaps many of them began to forget that anything better existed. After all, six years is a long time, especially if death and destruction is raining down upon a country!

By the end of the war the whole economy of the country had broken down. There were not enough houses, not enough consumer goods. Industry had to be switched back to peaceful manufacture. England had sold all her investments abroad to help finance the war, and now she found it necessary to export about twice as much as she had done prewar to pay her way at all, whilst at the same time her people were desperately in need of these same goods. Here surely was a chance for private enterprise to show what it could do!

But a new generation of voters had grown up, irresponsible and knowing little of prewar liberties, schooled only in warfare. The Trade Unions had gained strength and the left political wing had gained adherents through friendship with Russia, at that time the victorious ally. Thus, the climate was right for the socialists, the state planners. Socialist preaching had its spectacular success, and in 1945 the strong socialist government was in power. Arguments by industry, by people who had successfully managed affairs to the common good before and during the war, were brushed aside, and it was left to the cab-drivers, labor leaders and left-wing intelligentsia to steer the country.

Now, somewhere I have read the statement, "The resources of a country should be developed, but only in the manner which best serves the users and the public interest generally." The interesting thing is that this statement is to be found in the private enterprise propaganda of a leading utility company in this country, in its fight against state (or what you would call federal) control of power generation. Yet British socialist planners would wholeheartedly endorse that statement, which to them expresses

Based upon an address before the Pacific Coast Electrical Assn. annual convention, Los Angeles, May 21-23.

Oliver W. Hindley is a mechanical engineer who was for several years chief associate editor of "The Engineer"—one of Britain's great technical magazines. Early this year he resigned his position, sold his farm, and came to the U. S.

their argument for nationalization. Many British socialists are idealists—visionaries—and their ideals are to be respected. But I have found it impossible to argue with them; they are quite impervious to argument and, as I have said, subscribe generally to the same ideals as the "private enterpriser." It seems that only events will change their minds.

In six years since 1945 this gang pushed through Parliament in indecent haste, frequently without even allowing the opposition time to discuss the details, statute after statute, nationalizing coal mining (the only great natural resource Britain has); road, rail and canal transport; electricity and gas generation and supply; health services; finance (the Bank of England); and now the iron and steel industry. In between whiles they increased the school-leaving age, so that there are now not enough schools or teachers to go around, and promoted the infamous groundnut (peanut) scheme, on which some fabulous sum was squandered. The only answer to that last one is the proverbial "Nuts." They jibbed at nationalization of the land, but they have succeeded in tying the farmer up in red tape to such an extent that the land is virtually nationalized already. All they need do to regularize the position is to pass another Act of Parliament.

All this was sustained by cries of "fair shares for all," even though the ineptitude of their bulk buying made the share all but invisible, and "full employment," which resulted not from socialist policies but largely from the generous aid given by Uncle Sam. They prated of a higher standard of living—higher than in the "bad old days of Conservative mismanagement"—and gave the people a standard, which got lower and lower; and they talked of health benefits from the cradle to the grave, and of many other things, desirable enough in themselves for an impoverished nation, fresh from the war.

To achieve these results the civil service was more than doubled; innumerable government agencies were set up. Municipal and local government offices were deluged with work delegated to them by the central agency. I believe the civil service proper now represents more than 750,000 of the 47,000,000 population; the local government services a like number; and recently the armed forces about 500,000—a total of more than 2,000,000 unproductive persons out of a total working population of about 20,000,000—just ten per cent. These figures take no account, of course, of people working in the nationalized industries. Perhaps that may not sound very high to you, but England is not now a very prosperous country and can ill afford such a luxury. Each of these persons has to be fed with imported food and consumes other imported goods; it seems to me that some at least of them might earn their keep more directly.

That is not the whole tale, for there is an incalculable but heavy load of wasted work on industry in trying to comply with the red tape. Farmers spend as much time in filling up forms as in ploughing, and industrialists have to maintain complete staffs to deal with tax, health stamps and government matters. The kind of muddle that goes on in government departments has to be experienced to be believed. About 2,000 government regulations a year have been issued in the past ten years—I hope my figure is correct, for I have a sneaking feeling that it might be 2,000 a month. Nobody can keep pace with them and even the government printers cannot get them issued in time for them to be of use.

The cost of all this, of course, falls upon the taxpayer. In the aggregate more than two-fifths of an individual's income goes in excise and income taxes, and company taxes are so high that in these inflationary times it is impossible to make proper provision for renewal of plant and remain solvent. The economy is stretched to the utmost; yet the planners can offer no prospect of relief, but only the opposite.

There are many other things I would like to talk about, such as the food subsidies and the unrealistic twist that has been given to the economic structure. . . .

I think I had better now turn to each of the nationalized industries. Coal mining was the first to which the master-planners gave their attention. Before the war the coal miners were badly paid; there was a good deal of unrest but fear of unemployment kept them working. But all the coal that was required was mined. Speaking without references, a total of 273,000,000 tons was mined during the prewar peak year, all without a master plan.

Now I believe that there was a strong case for government action, framed in such a way as to have encouraged the mine owners to have given better wages and conditions of employment in the industry. Coal mining is one of Britain's basic industries—all other industries depend on plenty of cheap coal—but I think it should not have been at the expense of the miner. Here was one of socialism's strongest arguments, but it could have been fully met by means other than nationalization.

Mine management was difficult during the war; miners were called up and machinery, of which there was little, became obsolete. Production fell to the bare minimum required for the war effort, with domestic use severely rationed and no margin for exports. Britain depends almost entirely on coal for domestic heating, gasification, electricity generation, steelmaking and railway operation, and has a traditionally large export market.

As soon the industry was nationalized everything was done at the mines that a prudent private manager, armed with fresh capital, would have done. Miners are now better paid than other workers, their rations are better and they have priority in getting homes. Many millions of pounds were and are being spent on machinery and improvements. Certain of the older mines were closed down, concentrating on the more efficient setups. But even so the record of results has been abysmal.

Instead of being attracted to the industry, miners drifted off as soon as the unpopular labor control was lifted, proving that socialism cannot work in times of full employment without control of labor. Targets were set up for minimum production; none was hit. These target figures were minimums and only allowed the domestic consumer 1¾ tons of coal a year—a great hardship in the English climate. With great difficulty 218,000,000 tons were mined last year, as against 273,000,000 tons prewar. Prices skyrocketed to nearly three times prewar; that perhaps would not have mattered if enough coal had been mined. It is a very valuable export commodity. "Don't carry coals to Newcastle," we used to say. Now Britain imports coal from the United States, very expensively.

Two great fuel crises occurred, when factories closed down and Stygian darkness descended upon the streets. Train services were cut. The prospect for future winters seems little better, and nobody, least of all the planners, is happy. Surely there is only one answer to all this; socialism had the power and the means, but could not do the job—its management was at fault.

Next on the list was nationalization of transport—the railways, road passenger and truck services, and canals. Perhaps there has not yet been time to develop the full miseries of railway nationalization. All I can say is that the trains run more slowly and are less punctual than they were at the beginning of the century and the railways lose the taxpayers' money faster than ever before. There is some labor unrest (that brings up the interesting question, how can a man change his boss in a nationalized industry?).

All road services have been taken over, except short hauls and except the right to carry one's own goods in one's own vehicles. How long these exceptions will be allowed is not certain, for rather than patronize the State trucking service, about which there are fearful tales of muddle and delay, many factories are equipping themselves with their own fleet of trucks. Fares and charges, more particularly those for road transport, are going up fast. This is possibly to divert traffic from the roads to the railways.

Next on the list was electricity and gas. Many private companies—in fact, nearly all—used to do a first-class job in this field. But they all went into the bag, and now there are power cuts, advertisements in the papers begging the public to reduce consumption, and price increases. How much of this is due to causes such as the fuel shortage and the need to export a proportion of the nation's production of generating machinery is debatable. But whatever the reasons the record is failure. And no prospect of improvement is held out until 1954 or later. The year 1954 represents 15 years since the war began for the Englishman.

Then we come to the health services. I am not specially qualified to speak about this, so I will skip it, except to say that the idea is fine but is not working well. Too much was attempted all at once, without the financial or the human means—not enough nurses or doctors or dentists.

Finally—though there is nothing final once these boys get going—we have the iron and steel industry. Now this item is a horse of a different color. The record of the British iron and steel industry has been fine throughout—practically no labor troubles and always on top of the job. This is surely the clearest case of all of nationalization just for the sake of the doctrine. As you know, they have only just now got their hands on this industry; what sort of a mess they make of it remains to be seen, unless the planners plan themselves out of power soon, of which so many of us are hopeful.

I hope you will have gathered from my remarks that British socialism as at present administered is a mild form of the disease, adapted to suit the "have-nots." It does not mean at all that the British character has changed or that there is any widespread leaning towards Communism. Indeed, in my opinion the revulsion of feeling against Communism is very strong, as was borne out by the results of the last election, when the small Communist element was entirely thrown out.

But I have also tried to indicate that, though rarely used, extreme powers reside with the government; that the liberty of the civilian has in theory been completely removed, though in practice, because of possible loss of public sympathy, extreme powers are not used.

It seems to me that the socialist program is like a narcotic or drug; given in small doses it is soothing and causes little alarm. But more and more is required to keep the patient alive, and finally the stage is reached when it either becomes a tragic habit or there is a strong revulsion of feeling. The people are realizing that the stimulating action of the drug is only temporary and that its continued use leads to failure. If only the English people, especially the younger generation, could be taken back twelve years to see things as they were in their true perspective, I believe the whole thing would be brought sharply into focus.

There is only one conclusion to all this—keep socialism at arm's length if you value your liberty, your country and your future. The ideas are soothing but they do not work in this worldly world. Human nature, which the planners can't plan, sees to that!

Construction scenes on the 200,000-kw Cabinet Gorge hydroelectric project of the Washington Water Power Co. on the Clark Fork River. Started early this year, the plant is scheduled for completion by fall of next year to bring in much needed power

Last month utilities and security analysts met in the Pacific Northwest for a clinic on financing. ALLEN A. SMITH, noted utility attorney, told the group that in meeting the area's electric power requirements . . .

Ideologies notwithstanding

EVERYBODY WORKS TOGETHER

IN the Pacific Northwest our electric energy needs are a little less than 3½ million kilowatts, with peaking requirements substantially in excess of 4½ million kilowatts. These demands in a low, or what we call a "critical" water year, exceed the capability of the resources of the area, although not its generating capacity. A hydrogenerator without water won't do much to light a city or operate a milking machine. Now, to make the best of this condition, we carry on by means of the Northwest Power Pool. Its operation was described briefly in a speech by C. A. Erdahl to the Northwest Public Power Assn. on April 13, 1951, in this fashion:

"I say to you now that the Northwest Power Pool, big and intricate as it is, covering more than 4,000 miles of interconnected high-tension lines, linking some eleven major generating utilities, exchanging daily up to nearly five million kilowatts of power, delivered by all of us to some one million Northwest customers, is held together by the voluntary unwritten agreement of the utilities forming the Pacific Northwest Utilities Conference Committee in partnership with Uncle Sam and the Bonneville Power Administration. It is a partnership for mutual advantage of everybody."

Such commingling of federal, municipal, county-wide districts, private corporations, which include cooperatives and REA's—all pouring in and taking from this giant pool—is unique indeed.

The pool, in round figures, represents an investment of $2,790 million. Out of this sum the distributors of the Northwest—public and private—represent $1,380 million, and the federal government $410 million in power facilities. Installation at Bonneville is a little more than 500,000 kw, at Grand Coulee nearly 2,000,000, with three units to be added this year, increasing the generating capacity nearly 400,000. The federal government has under construction Hungry Horse in Montana—chiefly storage, Chief Joseph in Washington, McNary on the Washington-Oregon line, Anderson Ranch and Albeni Falls in Idaho, Meridian and Detroit in Oregon and some minor plants.

The federal government limits its activities to generation and distribution on a wholesale basis. It serves only those consumers who require a large amount of power and have a high load factor. It therefore falls to the distributors—public and private—to carry the responsibility of the door-to-door deliveries of electric service. They must build the distribution facilities, and upon them rests the burden of providing electric service to the million consumers referred to by Mr. Erdahl, and to see that energy is there when the switch is turned on. To provide such service these distributors in the last five years have spent in excess of $350 million—nearly as much as the federal government has invested in generation and transmission. The amount that they will spend in the next five years is set forth in the accompanying table. The money already spent is largely in improvements and betterments.

These distributors are alive to the existing needs, and are doing their part in planning for a rapidly expanding and growing area. The federal plants will come in—depending, of course, on Congressional appropriations—gradually over the next seven to ten years. The non-federal plants will come in more rapidly—some as early as next year. Some of them are awaiting action by the Federal Power Commission. Thus you see how the program of these distributing agencies—the local units—fit their plans to the big dams built by the federal government. The extension and strengthening of facilities is a never-ending program, and will go on in much the same fashion as it has in the past. It is plain from these figures that, while the government is spending large sums in the construction of dams and high-voltage transmission lines, there is a job of equal proportions to be carried on by the local agencies.

Now, what does all this add up to? Just two things: A "live and let live" policy amongst this family making up the power pool. The trial marriage already has increased our peaking capacity nearly 700,000 kw and nearly 400,000 kw in energy. A family getting along so well should not be discouraged at differences of opinion that arise from time to time.

It is also a partnership on the highest possible plane—a responsibility recognized by all its members to meet the

Estimated Construction Expenditures of Northwest Utility Companies, 1951-55

Company	Expenditures	New Capacity (kw)
California Oregon Power	$ 55,000,000	225,000
California Pacific Utilities	5,250,000	.....
British Columbia Electric	111,000,000	250,000
Idaho Power	90,000,000	225,000
Montana Power	36,000,000	60,000
Mountain States Power	19,750,000	.....
Pacific Power & Light	53,750,000	108,000
Portland General Electric	59,000,000	125,000
Puget Sound Power & Light	25,000,000	225,000
Utah Power & Light	70,000,000	225,000
Washington Water Power	57,000,000	200,000
TOTAL	$581,750,000	1,356,000

electric power needs of the area, with ideological differences reduced to a minimum. Lest there be misunderstanding, let me add: Some of these ideologies are deep-seated and, in the opinion of some, must be solved before the best possible job for the area can be done.

Seated at this family table, yearning—perhaps even now assuming—to be its head, is the federal government. Utility dealings in this region are almost exclusively with the Bonneville Power Administration. Well, when it comes to dishing up the food, "us" private utilities have sometimes felt, and on occasion have said, that our customers—because we are only an agency to serve them; they are the people most vitally affected—are compelled to sit at the foot of the table and get only the crumbs that are left after all others have been served. This treatment has sometimes been defended by the so-called "preference clause" in the Bonneville Act. This preference clause is a relic of a Reclamation Act passed in 1906, at a time when the government could scarcely be said to be in the power business. At that time the amount of power the government had to sell was so small that it wouldn't make a dot on a curve in a chart to show power supply. Today, the situation is vastly different. In 1950, the federal government generated almost 20% of the nation's power supply, and in this area for the year ending June 30, 1950, Bonneville generated 52% of the power requirements.

So, a preference provision—possibly justified at the time it was passed—is neither a fair nor a valid criterion when the conditions have so radically changed as they have in the power business in that period of time. Furthermore, to the extent that a producer becomes dominant, preference provisions operate as a discrimination and a weapon of aggrandizement. The least that can be said on this subject is that it should be re-examined, in view of the changes that have been pointed out, to determine whether it is a rule that should be continued. It has been contended that the federal government in the power business possesses the status of a utility. The most exacting requirement in utility statutes is that service must be provided without discrimination. Discrimination is the very essence of preference clauses, and repugnant to our conception of business morals.

In defending practices under the preference clause, a companion provision is generally overlooked. The Bonneville and other acts also include a provision that the production of energy is primarily for the benefit of domestic and rural consumers. Now there can be no very valid distinction between such consumers because of the agency which serves them. Both public and private agencies are vehicles for providing service, and in their operations both must adhere to certain general principles—good service, continued power supply, sound financing, and earnings sufficient to pay the rental cost of money. The principal difference in these matters is that public agencies finance entirely, or almost so, by debt, while private companies do so partly by stock. Public agencies have a tremendous advantage in taxes, somewhat mitigated by requirements for debt amortization. I do not propose to discuss the relative merits of the two operations, as I do not consider this to be the place for such a discussion, but I mention these factors only to make clear that, based on the criterion pointed out, discriminatory action against one class of domestic and rural consumers cannot be logically defended, and it is doubtful that it has legal justification solely on the basis of the agency serving them.

Much of the confusion comes from the lack of a well-thought-out and logically built power policy on the part of the federal government. We have the Reclamation Act, the Flood Control Act, various Rivers and Harbors Acts, the Bonneville Act, the combined Reclamation-Army-Engineers Missouri River plan, the TVA, the Southwest Power Administration, the Southeast Power Administration, the Federal Power Commission—with differing provisions and covering a myriad of conditions. This all creates an atmosphere of uncertainty and apprehension that is a real handicap to well-planned construction and financing. However, in this area we have not despaired, but have gone ahead and by actual practice and experience solved many of the problems inherent in a situation so utterly confusing. There are ahead some major adjustments to be made, but we have gone far enough that we are confident they can be resolved. However, it must be done in a spirit of good will and a real disposition to reach a fair and equitable conclusion. It can and will be done if we set our faces to the task.

Allan A. Smith is a partner in the law firm of Laing, Gray & Smith. He is an outspoken advocate of free enterprise and has appeared in many cases involving utilities in their relations with government agencies

Civil defense planning is being taken seriously by Pacific Power & Light Co. A full-time retired army colonel has been employed to draw up a realistic and workable plan and coordinate activities with city, state and federal groups. F. L. BEADLE says . . .

Utilities should

PLAN NOW FOR CIVIL DEFENSE

RESPONSIBILITY for providing continuous service to its customers at all times is fully realized by the public utility industry. The industry is also fully conscious of the hazards of modern global warfare. We are informed that no part of the United States can be considered immune to enemy attack. Predictions have been made as to the times when various critical targets might be subjected to the terribly destructive force of the atomic bomb.

In World War II, German electric installations were only occasionally specific bombing targets. Concerning this, The United States Strategic Bombing Survey's German Electric Utilities Industry Report contains the following: "Had electric utility plants and large substations and the larger industrial power plants been made primary targets as soon as they could have been brought within the range of allied strategic bombing attacks, all evidence indicates that the destruction of such installations would have had a catastrophic effect on Germany's war production." We may be very sure that in World War III a major effort will be made to destroy our electric power plants. It is generally concluded that something should be done—the question is, what should be done and when should we do it? A study of the complicated international situation leads only to abstract conclusions.

Despite all this, Pacific Power & Light Co. has attempted to draw up a realistic and workable civil defense plan. Any workable plan must be based on a real or assumed situation. Since factual data were missing, it was necessary to make certain assumptions as follows:

1. The difficulties of enemy attack are such that general long-range bombing against the United States with anything less effective than atomic bombs would be highly improbable.

2. Atomic bombs would be used by the enemy only against targets of the highest priority and densely populated areas.

3. The enemy would make a full-scale effort to impair the productive capacity of this nation by means of sabotage and subversive action. All parts of the company system are subject to this hazard.

From these assumptions were determined the civil defense measures applicable to each part of the utility's system. In time of war, certain parts of the system will be left entirely unprotected so that the company will be able to concentrate its efforts for the protection of vital installations. Calculated risks must always be taken in the interest of economy and efficient operation.

Pacific Power's civil defense organization is based on the existing organization with an assignment of additional duties and responsibilities to certain employees. The program is also based, to the extent feasible, upon existing programs maintained as normal business practices. It is obviously impossible in these years of restless peace, to keep an industry keyed up to a wartime program.

What Utilities Should Do Now

1 Appoint a civil defense coordinator. The duties of the coordinator may be assigned to a present employee such as the safety engineer. Larger companies with extensive systems will find the need for a full-time employee.

2 Set up a civil defense organization. The present line organization should always be used with an assignment of additional duties and responsibilities.

3 Prepare a plan to include all those measures which would be placed in effect immediately on the outbreak of war or when the international situation indicates that war is imminent.

4 Institute a progressive training program. The first objective should be the establishment of high peacetime standards in first aid, fire protection, and accident prevention training. Supervisors in critical target areas should also receive instructions concerning hazards of modern warfare.

5 Put in effect at the larger power plants certain internal security measures to safeguard against sabotage: (a) Close the plants to the public. (b) Screen employees for subversive tendencies.

Our company plan constitutes a statement of policies concerning the various elements of civil defense such as plant protection, warden service, continuity of control, dispersal of materials and equipment, mutual assistance, training and restoration. The details to carry out each part of the plan are not yet completed. Our idea is that well-considered policies will remain fixed while the details will change from time to time. As the war risk increases, the measures in effect will be increased successively in accordance with the general plan.

We might look at certain elements. Plant protection, for instance, is made the direct responsibility of the superintendent in charge. Except for those plants in the large metropolitan area of Portland, plans are concerned entirely with antisabotage measures. Certain measures are applicable now, such as closing the plants to the public and screening employees for subversive tendencies. Further internal security measures are considered in plans for the future, but only from a standpoint of effectiveness. No measures will be adopted merely to satisfy the public. Consider one of our hydroelectric power plants. It is surrounded by a man-proof fence erected in the early days of World War II. It was first assumed that the plant had sufficient capacity to justify consideration of a guard system. A guard at the entrance gate might impress the

public but he would not be effective in preventing determined saboteurs from entering the plant. He could not guard all avenues of approach at one time and would be entirely vulnerable to attack. To be effective, a guard must be posted in an elevated protected shelter where he is safe from attack and can command all avenues of approach. He must be armed with an automatic weapon. Considering the plant under discussion, the principal question was whether future plans should provide full-time guards to prevent entrance to the enclosure or rely on the operators to protect installations within the power plant building. With some simple installations, guarding of vital equipment can be performed almost as effectively by the operators on duty and at a much less cost. For those plants in a critical target area, plans for the future provide for certain measures to minimize losses from enemy attack. Expensive protective construction of barriers and shelters are not economically feasible.

In the city of Portland, a warden service is being organized. Therefore, such a service is being organized in the Pacific's main office building where there are several hundred employees. For the time being, we are setting up this organization under the building manager. Training of individuals in assigned duties is being deferred. Similar organizations are being formed elsewhere in the Portland area where we have a large number of employees.

We are, of course, concerned that there be no serious interruption in the control of the company's activities. So, we have made plans for an emergency headquarters or control center, established a "succession of command" and are providing for the duplication of critical and valuable records, such as maps and diagrams. A control center will be established when the situation becomes critical. If necessary, it will be possible to direct rehabilitation from this control center, which will be located at some distance from present headquarters.

The "succession of command" is a list showing the names of the replacements for all of the key personnel in the critical target area. The establishment of such a "succession of command" is important in preparing for a war catastrophe.

We have also initiated a program for the duplication of certain vital and valuable records. Vital records are those records which are needed to continue operations. Valuable records are those needed to prevent large financial loss. Unless duplicates are on file in some other locality, it is the plan of the company to microfilm or otherwise make copies of these records.

Dispersal of materials and equipment is considered as a wartime measure. It is not possible for any industry to operate efficiently if stores and equipment are not concentrated by localities. Pacific Power, however, is a widespread system and as a result has stores in five broadly dispersed warehouses. Of course, in the city of Portland, stores and equipment are concentrated in one locality. Our plan is to continue normal operations until the international situation becomes more acute. Then we will reduce the level of supplies at the present Portland warehouse and build up at dispersed localities close to the city but well outside the target area. At that time also, dispersal schedules will go into effect so as to prevent concentrations of equipment.

One of the reasons why it is so necessary that civil defense planning be initiated well in advance of any emergency is to complete mutual assistance agreements. This is quite simple within our company system. It is merely a plan to bring into the disaster area every possible assistance in the way of equipment and personnel from Pacific's non-affected areas.

Col. F. L. Beadle, coordinator of civil defense for Pacific Power & Light Co. A veteran of two world wars, he was retired from the corps of engineers after a 30-year army career

The matter of mutual assistance between different electrical utilities requires much more consideration. When two utilities are located in one municipal area there generally exists an understanding of mutual assistance in time of emergency. In time of major catastrophe, assistance would be required from companies located in distant areas. In this region, efficient utilization of power is accomplished through the Northwest Power Pool. This pool operates without contractual agreements. Mutual assistance in time of disaster can also be accomplished without formal contracts but there should be established very clearly defined policies so that such assistance would be spontaneous.

The final plan is concerned with an attack restoration program. Unfortunately, the effectiveness of any such plan can only be determined after necessity places it in operation. We do have certain precedents to follow. Electrical utilities in sections of the United States that are periodically subjected to hazards, such as hurricanes, have carefully planned storm restoration programs that have been put to the test. Since a disaster resulting from an atomic attack would be similar to that resulting from a hurricane or fire, but of greater proportion, there are patterns to follow. We are now preparing a restoration program for rehabilitation of Pacific Power facilities in the city of Portland. There are many elements to be considered and it is expected that the plan will be revised many times before it is completed. Briefly the elements are:

1. Establishing an emergency headquarters or control center.
2. Manning this control center with certain key personnel who will direct rehabilitation.
3. Dispersing of equipment and stores.
4. Establishing emergency communication facilities.
5. Defining essential customers and priorities.
6. Maintaining close liaison with local civil defense agencies and other utilities.
7. Assigning specific duties and responsibilities to all individuals concerned with the program.

The most important element in any plan of operations and the one that is generally the most difficult to determine is the element of time. In the Pacific Power plan, the word "critical" is used. It may be defined as applying to the situation when this nation is at war or when war seems imminent. Since the latter is a matter of judgment, it is thoroughly understood that no provisions of the company plan that are operative in a "critical" situation will take effect without specific direction of management.

We plan a continuous study of the company position. Considering the hazards involved and the imminence of hostilities, as well as the limitations imposed by the availability of capital, our management will be prepared at any time to determine the protective measures that should be placed in effect. Our company believes the things listed in the accompanying box are the measures that should be taken now.

Credit controls were only meant to restrain house building to 850,000 units this year but have really slowed down the rate so that, unless some easing is done, says FRITZ B. BURNS, dynamic builder, there won't be enough units for growing population. That's

What makes

THE DARK FACE OF HOUSING

PREDICTIONS of West Coast homebuilders seven months ago that federal restrictions on home mortgage credit would make too deep a cut in the volume of new home construction seem to be coming true. Straw in the wind is a recent report of the Los Angeles FHA office, which indicates a drop of 60% in the number of new unit applications below June 1950, the last month before the controls were imposed.

The avowed purpose of the credit regulations was to reduce home construction to 850,000 units, 40% below last year's record production. But the experience of the Los Angeles FHA office is apparently symptomatic of what is going on throughout the country.

Nationally, FHA reports having received 18,333 applications in March this year as compared with 47,625 received the same month in 1950. Since the first of January, applications have averaged about 14,000 per month, which means 170,000, possibly 180,000, for the year. Considering that FHA accounts for about 35% of the new home mortgage financing, it is hard to see at this time how the target is going to be reached.

In terms of new housing starts the picture seems to shape up differently. This is because of the large carryover of new construction based on applications filed before Regulation X was put into effect last October.

According to the National Association of Home Builders, 360,000 units were involved in the carryover—construction that will not be completed until late spring. In February, 80,000 new units were started, which was 8% below January's starts and only a bit under February of last year. The 93,000 starts in March compare with 117,000 starts a year ago. This has given rise to greater confidence that the production goal will be reached—an optimism that the experience of FHA would not seem to warrant at this time.

Having a bearing on the final result is possible government action with regard to the designation of defense areas. This is one of the devices the government can use to increase home building by relaxing credit restrictions.

The Housing and Home Finance Agency has thus far recognized three defense areas: Paducah, Ky., Savannah River, Ga., Idaho Falls, San Diego, Corona. In these the mobilization effort has brought an influx of workers requiring more housing than was available. HHFA action was in effect a permit for the construction of a stated number of homes that buyers will be able to purchase on relatively liberal terms.

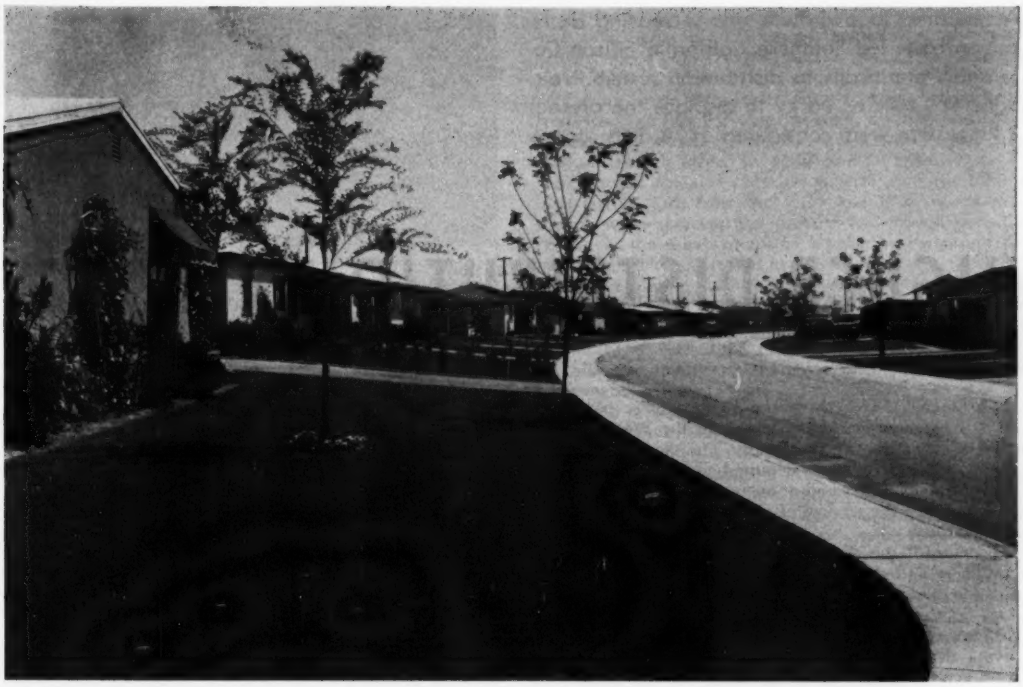
There is a growing clamor from nearly 100 other areas for similar concessions on the ground that a housing shortage actually exists or is in the making. The government is apparently reluctant to recognize these claims except after prolonged investigation.

Fritz B. Burns, manager of Kaiser Community Homes Inc., Los Angeles, speaks as chairman of the educational committee of the National Association of Home Builders, as well as a man who has built more houses than possibly any other individual in the state of California

The uncertain situation that exists with regard to the supplies of critical materials, of course, has something to do with this reluctance to act. While no one would dispute the necessity of supplying materials for defense housing wherever needed, the present situation is cloudy enough without these special cases.

With steel, copper and aluminum coming under CMP July 1, the production of structural steel, wiring devices and supplies, lighting fixtures, cut nails, millwork, plumbing fixtures and a host of other items used in building will be controlled. But the producers of refrigerators, heating and cooking equipment, and electrical appliances—standard equipment that comes with every new house these days—will have to hunt in the open market for their share of raw materials. In the whole complex process of fitting needs to supplies, there is no telling how much of the critical metal items will get to building sites.

Homebuilders expect that inventories in the hands of manufacturers and wholesalers will have run pretty low by the last quarter of the year. Even now sheet metal is hard to get and so are reinforcing rods. The use of copper tubing for radiant heating was prohibited on March 31. Gas water heaters will become increasingly scarce since production is down 50% because of the lack of steel. Steel outlet boxes, although not on the steel order, are suffering from the voluntary allocation of steel. Bakelite may serve as an alternate for steel in making these boxes, since it already has the approval of the Underwriters' Laboratories. However, Bakelite itself may become short because of limited supply of phenolic molding powder brought about by an added demand for benzine used in synthetic rubber. Production of electric motors, much in demand for the Air Force, is down 20% from last year



Typical "curvilinear" street of Panorama City in southern California. This is the type of reasonably priced housing Burns advocates

because of shortages of copper, cobalt and nickel. Aluminum windows are now being made only from shapes on hand April 30 with production scheduled to come to a halt on June 30. The cupboard may be bare this fall before CMP will have had a chance to do the good it can do.

Recognizing this possibility is only to cast further doubts on the ability of the homebuilding industry to produce the requisite number of houses this year. This may not be too serious a blow to an industry that has enjoyed a high degree of prosperity in the postwar period, but it does raise some fundamental questions of policy.

By what manner of reasoning was the production goal for new houses set this year? Admittedly it was a shot in the dark without statistical basis whatever.

The goal of 850,000 new dwelling units merely expressed a purpose: to curb inflation—inflation arising from the fiscal policies of the government—and to conserve critical materials at a time when military requirements for such materials were largely unknown.

Under CMP, the process is to divide up the shortages until production of scarce materials can be beefed up to take care of all requirements. How, then, will new home construction be treated in the vast stretches of country outside of the defense areas?

Obviously, consideration must be given to other factors having to do with the character of the product itself. Next to food and clothing, housing is one of the prime necessities of life. When production goals are set under government orders, it should be done in terms of our basic shelter needs.

These may be seen in the extrarodinary growth in population that has taken place in the past ten years. Each year there has been a net gain of 2,000,000 persons. As the birth rate has increased and the death rate declined, the net increase in population will probably continue to mount.

On the average, 500,000 new families are formed every year—families who want and need homes immediately. It may be argued that many of these families can and should double up, but this solution is too easy.

The census reports that there were 2,282,000 families doubled up April 1947. In the succeeding years, the homebuilding industry produced at a record rate, yet in April 1950 the number of families doubled up had been reduced by only 17,000. New homes should be built in sufficient numbers at least to keep level the number of families doubled up, to say nothing of reducing that number.

Because of fires, obsolescence and other causes, about 50,000 dwelling units are lost each year. These homes ought to be replaced.

Similarly, something should be done to rehabilitate or replace part of the 7,400,000 substandard homes that exist throughout the country.

Beyond these evident requirements, consideration should be given that unique American characteristic—the deep desire for a new and better home tomorrow even when today's shelter is adequate.

These facts reveal the nation's urgent shelter needs. They exist and will continue to exist whether we have peace, a shooting war on a global scale or mobilization for the "garrison state." They suggest a new basis on which to determine the credit and materials restrictions to be applied to the construction of new homes during the next year.

Electrical West—Vol. 106, No. 6

Accelerated load growth and increasing distribution costs led Southern California Edison Co. to analyze critically its distribution system. Voltages of 11 kv or 16 kv to displace the present 4-kv system were considered. H. A. Lott reports

HIGHER DISTRIBUTION VOLTAGE

BEGINNING early in the 1940s a large population movement started migrating to the Western states, particularly to California. The new homes, new farms, and new factories required to house and employ the new people increased at an unprecedented rate. They all demanded the services of electricity in an ever increasing quantity.

Because of the accelerated increase in the number of customers and demands and because of the rapidly increasing costs of all components of the distribution system, Southern California Edison decided to take a critical look at its distribution system. Was it capable of supplying the demands that might be placed upon it and were general plans for its expansion based on sound economics? To obtain these answers, an economic and capability study was undertaken.

The study was made in the planning division of the operating department. One engineer, who had both distribution and general utility operating experience, was selected to head up the study. He received direction, consulting assistance, and constructive criticism from other engineers in the division and from the distribution engineering staff and field superintendents. The report on the study, which was recently completed, gives a comprehensive and detailed analysis of the company's distribution system. It gives an economic comparison of the cost to serve at different distribution voltages, and recommends a plan for serving increased loads from the distribution voltages available in each of the Edison district areas. Obviously such a study cannot be covered fully in the space limitations imposed by this article. However, the "table of contents" for the higher distribution voltage study here reproduced indicates its scope and detail.

Present System

Before discussing results and conclusions obtained, it will be advantageous to describe the Edison system briefly and indicate the various voltage levels between transmission lines and customer's meter. Briefly, Southern California Edison Co. supplies electrical service in nine counties in southern California. Its peak load has doubled in the past seven years and is now above 1,450,000 kw. The distribution system contains approximately 1,750 miles of 16-kv, 7,850 miles of 11-kv, and 7,000 miles of 4-kv circuits. Domestic, commercial, industrial, agricultural, railway, municipal and wholesale users of electric energy are supplied from the company's system through 3,150,000 kva of distribution transformer capacity and one million meters.

The path of power on the Edison system from the generators through the several transmission and distribution voltages to the customer's meter is illustrated by Fig. I.

The three principal distribution voltages used are 16 kv, 11 kv, and 4 kv. The 7 kv was not directly included in the study since its use is confined to an industrial area operated under a lease agreement. The 16-kv and 11-kv distribution systems each serve separate portions of the Edison service area. Both 11 kv and 16 kv are used for distribution because the original company and another large utility, which consolidated with Edison prior to 1920, had different voltages in their respective service areas. The 4-kv distribution areas are within and in effect form "islands" in both the 16-kv and 11-kv service areas. Fig. II illustrates the extent of the territory served by each of the higher distribution voltage systems.

Scope of Distribution Study Made by Southern California Edison Co.

Review of study and recommendations.

Summary of distribution practices and trends in the United States.
- Conventional systems.
- Higher distribution voltage systems.
- Primary network systems.

Cost study of standard distribution equipment.

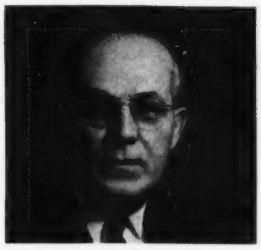
Edison distribution voltage history and statistics.

Statistical data—4-kv substations.

Cost effects of special requirements for higher distribution voltages.
- G.O. 95—overhead rules of the California Public Utilities Commission.
- Joint pole practices.
- G.O. 52—inductive coordination with communication lines.
- Accident prevention rules.

Plan for load growth at 4 kv.
- Discussion.
- Plan in districts with 11-kv lines.
- Plan in districts with 16-kv lines.

Plan for load growth at 11 kv and 16 kv.
- Discussion.
- Plan in districts with 11-kv lines.
- Plan in districts with 16-kv lines.



H. A. Lott is executive engineer of Southern California Edison Co. He speaks from a rich background of utility experience, having been operating engineer just prior to his present position

As a general rule, domestic customers, commercial customers, and small users of power in the urban, suburban and larger rural communities are supplied by 4-kv regulated distribution circuits. The larger power customers and small industry in urban areas and most customers in the agricultural areas are supplied direct from the 16-kv or 11-kv lines. These are also the supply lines for 4-kv substations. Large industrial loads are served by consumers' substations supplied from 66-kv, 16-kv, or 11-kv lines, depending on size and location.

The two principal objectives of the study were to determine: (1) is 4-kv distribution capable of supplying the future demands which might be placed upon it, and (2) would a higher distribution voltage provide more economical service than distribution at 4 kv?

Results of Study

It was found that the Edison 4-kv distribution system could be expanded to supply future 4-kv loads substantially in excess of double the present demands because of the comparatively low load density. The average density of the load supplied at 4 kv in the 909 square miles of 4-kv service area was 597 kva per square mile. Maximum density was 7,000 kva per square mile. The relatively low density is the result of limiting the height of buildings, more single dwellings than apartments, competition from low-cost fuel for water heating, cooking and space heating, and the fact that the large loads in the 4-kv area are already served by 11-kv or 6-kv lines.

The study revealed that the general plan for serving large urban loads from the 11-kv and 16-kv distribution systems was sound and this practice left enough potential reserve in the 4-kv systems to supply the increasing demands of customers served at 4 kv.

However, because of increasing use per customer and increasing load densities, in order to supply the possible future 4-kv demands, it will be necessary to expand the capability of 4-kv distribution to a greater extent than has been the practice in the past. Among the possibilities for expansion are: (1) the use of 300 and 400 amp circuits with plus and minus 10% voltage regulation instead of using 200 amp plus and minus 5% circuits; (2) the future use of 4-kv substations with capacities up to 18,000 or 30,000 kva in the areas of greater load density supplied from 66-kv transmission lines instead of limiting such substation capacities to 9,000 or 12,000 kva with the principal sources from 11-kv and 16-kv circuits; and (3) the future use of bus voltage regulation in high density areas instead of the continued use of individual circuit regulators. The resultant reduction in the number of new stations required to supply increased demands and the lower unit cost of larger equipment will also result in a lower cost per kva delivered to the customer's meter.

The question of economics of 4-kv distribution as compared to distribution at a higher voltage is quite complex. In general it was found more economical for Edison to retain 4-kv service in the areas where 4 kv is already established than it would be to change to a higher voltage.

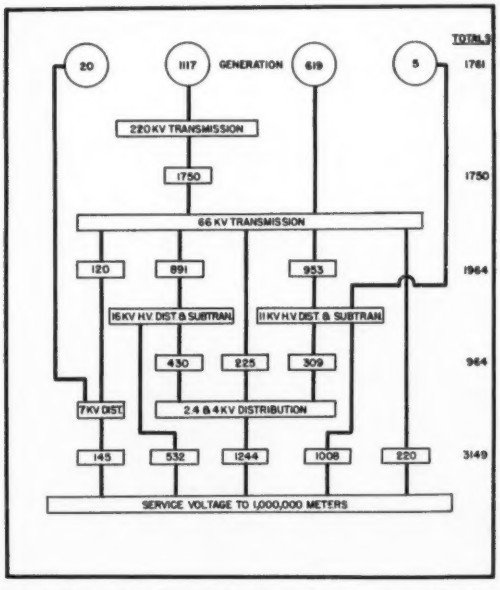


Fig. 1. Power flow diagram from generator to customer's meter for Southern California Edison system. Generator, transformer and total capacities shown are given in thousands of kw or kva

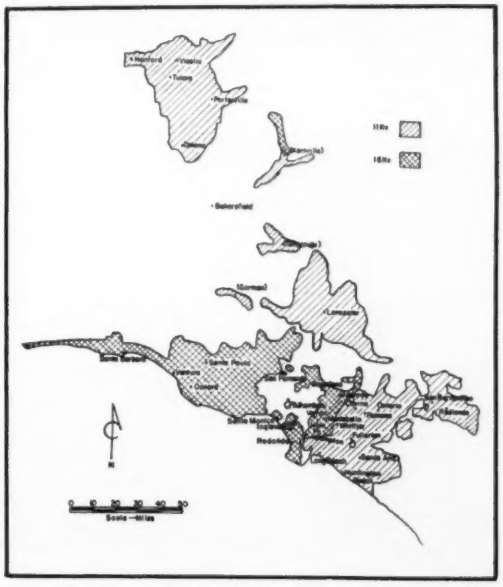


Fig. 2. Higher distribution voltage service areas of Edison system. Areas are about equally divided between 11 kv and 16 kv on the company system. Large urban loads are served from both

In making the economic study, costs of several standard distribution voltages were analyzed for comparison in an effort to find one voltage which could be substituted for both 4 kv and the 11 kv or 16 kv. Such a substitution is not practical from the economic standpoint. After an investment has been made in a distribution system, the cost of conversion to another voltage plus the loss on obsolete equipment retired will eliminate the economic advantage that might otherwise result. The nearest approach to such a substitute voltage on the Edison system was 11 kv (standard 12 kv). That was because 11 kv was already an established distribution voltage.

As a general rule, it was found that only two conditions will justify changing voltage in an established distribution area. First, if the lower voltage is not adequate to serve the increased demand, then the use of a higher voltage to supply part of the load or conversion of the entire area will become a necessity. Second, when a substantial part of the conversion cost can be charged to modernization or rebuild, the reduced charges against conversion frequently justify the change. Because of considerable new construction on the Edison system during the past ten years, such an allocation of charges could not be justified, except in special cases.

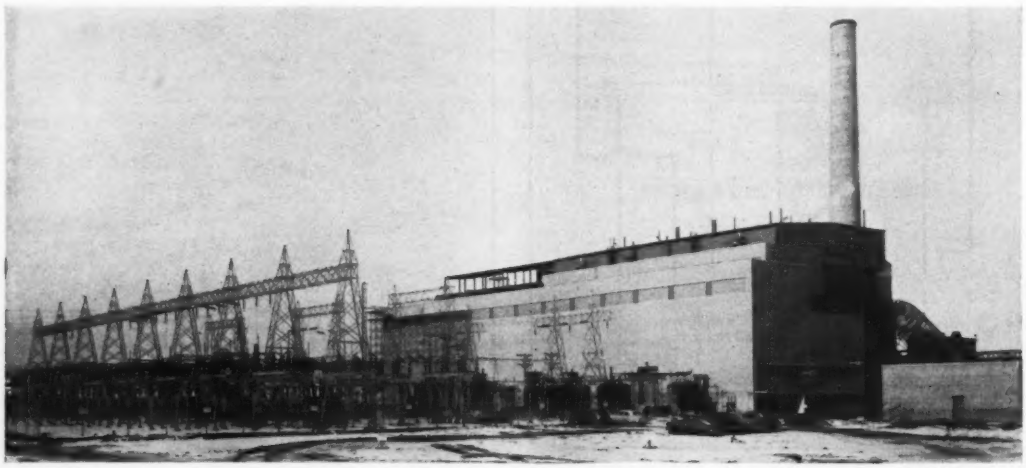
Edison's 16-kv distribution system received special analysis because 16 kv is not a standard voltage and 16-kv distribution equipment costs are substantially higher than either 11-kv or 4-kv equipment costs. It is not feasible to change 16 kv to 11 kv for the same economic reasons which prevent a change from 4 kv to 11 kv in other parts of the system. It was also found economically undesirable to establish a third and standard voltage 11-kv distribution system within the areas that now have 16-kv service. Practically, 16 kv is a good distribution voltage. It supplies 4-kv substations and moderately heavy industrial load in the more densely loaded areas in the company's territory. A fully loaded 16-kv line will transmit 50% more power than an 11-kv line with the same copper. If 16 kv is eventually adopted as an Industry Standard, it is expected that the cost saving features arising out of an accepted standard will lower the costs of 16-kv distribution so that from an economic standpoint, 16-kv distribution will compare favorably with 11-kv distribution.

It was found that 11 kv was usually a more economical voltage than 4 kv for supplying newly developed areas because of the increasing high cost of new 11/4-kv substations which are not needed with 11-kv distribution. The 11-kv distribution receives a substantial economic assist for service to new areas. This is because it can deliver the same power to a customer nine times as far from the source as 4 kv can deliver with the same percentage regulation. There are many opportunities to reduce distribution costs by the use of 11-kv distribution. However, low cost construction features such as common neutral, single-phase taps without crossarms, and single-bushing transformers cannot be used in California. The rules for overhead line construction prohibit the common neutral above 5 kv. This and other local practices prevent 11 kv from being as competitive with 4 kv as it may be in other areas.

More of the new loads can be served economically at 4 kv in the 16-kv areas than is the case in the 11-kv areas. However, even in the 16-kv areas, substantially more of the new loads can be served economically at the higher voltage than past practice indicated. Again this is because of the increasing high cost of new 16/4-kv substations. These substations are not needed with higher voltage distribution.

In analyzing the study, it was concluded that major changes in the established distribution voltage areas were neither necessary nor economic. However, more emphasis should be placed on the higher distribution voltages for direct service to customers. The plan for serving increased loads recommends that most new loads that are beyond the reach of 4-kv circuits should be served by 11-kv distribution, and 4 kv should be restricted to its present area. Rural and lightly loaded circuit ends should be cut over to 11 kv and more of the heavy loads in urban areas should be supplied from the higher voltage distribution. Distribution costs can be reduced substantially by serving new and increased loads in accordance with the detailed plan developed from the distribution study.

Essentially the plan proposes taking advantage of the many cost reducing refinements that can be made in most distribution systems.



Arapahoe steam plant of the Public Service Co. of Colorado at Denver. Third and last 40,000-kw unit is scheduled for operation in November of this year. Pulverized lignite coal and natural gas are the fuels. Steam conditions are 850 lb, 900°

ELECTRICAL WEST

Sales Guide

News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

June 1951 ©

All kinds of schemes and gimmiks are being tried all over the country to try to lure a few buyers in for the appliances that have filled the floors of dealers and distributors. More legitimate ones have been Frigidaire's "save for the down payment" plan and similar real selling ideas. Less commendable have been wild down payment offers, dumping prices and even a few who've chiseled on Reg. W in undercover deals. But the crooks are always present in any business and are not ones to follow in tactics.

Trying everything

Selling is hard to do these days. Buyers are shy. Combine this with a seasonal slump anyway, on top of prebuying by those who scared easily and this is the pay-off. Irony of it all is that the latter part of the year will probably bring shortages again. Already some makers of TV sets have cut back production. A few appliances are short.

Irony of it all

Banks and credit sources are putting heat on to collect on inventory and floating loans. Normal charge accounts on dealers' books are slow pay. New credit applications for time accounts are getting a colder eye as population shifts begin again due to the defense program.

Slow collections

While the 25% excise tax proposed for TV and appliances was turned down by the House Ways and Means Committee efforts to get Federal Reserve to soften up credit a little, even to permit that trade-ins be allowed as part of the down payment, failed to get to first base. But Congress must decide whether to extend FRB's power to control credit after June 30.

Taxes; Reg. W

OPS now has all appliances and radio-TV under one order or another, and even has servicing under CPR 34. Eventually, our Washington Office tells us, OPS hopes to impose preticketing such as used during the last war. Manufacturers would tag each appliance with its ceiling price. Rollbacks aren't likely on appliances. A few manufacturers, such as Proctor and Nesco, and S. F. distributors, Thompson & Holmes, have promised to protect dealers against rollbacks if any come. Gibson told its dealers its calculations indicate no rollback on its refrigerators.

Prices and rollbacks

Fair Trade got a body blow from the Supreme Court which ruled in a liquor case that unless a dealer signs a promise to maintain a manufacturer's price he isn't bound by it. Makes it necessary for manufacturers to sign up every single dealer, and even then they can't control the slicker who buys a bankrupt stock and cuts the price as a come-on.

Harder to enforce

Scanning TV

Television news is as varied as the scope of programs these days. . Electric League of Los Angeles TV committee headed by Bob Davis is asking all dealers and distributors to drop into their ads these cute little cartoon plugs to "sell the show." . Wilcox-Gay, makers of Recordios and Majestic TV, has leased a plant in Burbank to make sets for western distribution. . RTMA says the outlook for production of replacement parts is excellent. . Walt Stickel, DuMont sales manager, made news by predicting the coax cable and microwave net would be finished in time for World Series and annual football classics. . San Diego's industry was turned down by FCC for another TV channel in the new allocation but across the border Tijuana will soon have two stations under no restrictions from U. S. bureaucrats. .

Mexico uninhibited

DuMont claims a new cathode-ray picture tube with built-in focus. Not only conserves one coil but eliminates fuss by set user. Other DuMont news - it promises to protect dealers against price drops or rollbacks; set up a service school in Los Angeles May 28 at 1235 East Olympic; appointed Thompson-Diggs Co. Inc. of Sacramento and San Francisco as north California distributor. . John Meck Industries is pushing its "Red Head" long distance TV receivers for outside metropolitan areas; has appointed Minthorne Music Co., Los Angeles; Ra-tone Electronics Co., Phoenix; Spitzer Electrical Co., Albuquerque, as distributors; guarantees prices until Sept. 15. . IEA in Salt Lake City heard E. L. Romney, mountain state commissioner of athletics, discuss the prospects for sportscasting. .

CBS at it again

CBS is negotiating to buy ABC as part of a deal to get itself more TV stations but will run into FCC's prohibition of owning more than one station in the same locality and another to owning more than five stations. It's a complicated deal. . Don't hold your breath waiting for the thaw of TV channels, as Portland is doing. FCC has received thousands of comments and protests over its allocation of channels to areas. DuMont has even submitted it an alternate list claiming present list makes networks impossible. . Emerson upped its TV prices as of June 1, ending a brief business getting spree, while Trav-Ler was being offered at $50 to $70 off; so was Olympic; and Admiral brought out a 14-in. screen table model at $159.95. .

Roll their own brand

Broadway Department Store in Los Angeles introduced its own brand, the BelAire, made for it and other Cavendish chain stores by Starrett TV Corp. . Bendix Radio has a new table model, 17-in. dark face rectangular tube, at $299.95; has advertised its position to its dealers. . Conrac, Inc. of Glendora, Calif., announces a new line of 16 console models with 16, 19, 20 and 24 in. tubes. . Magnavox ad-of-the-month first prize winner was James W. Crawford of W. & J. Sloane, San Francisco. . Packard Bell has come back with a new Phono-cord radio-phonograph-recorder with two speeds. . San Diego Bureau of Home Appliances has set up a new retail television division following five successful special TV meetings. It is separate from the Bureau's electronics division and is designed to aid in TV sales problems. Otto Brandt, vice-president of ABC's TV stations, joins station KING of Seattle June 1 to be vice-president and general manager of TV, AM and FM operations.

"Loud voice"

The man who invented the loudspeaker, Edwin S. Pridham of Oakland, one of the founders of Magnavox Co., was honored May 8, celebrating his 40th year of association and development work.

Cecil Boyd, Boyd Distributing Co., Denver, has appointed Richard L. Brown as general manager. Brown came from B. F. Goodrich Co. Others named are Robert Hansen, operating manager; R. L. Harbaugh, sales manager; G. D. Hanna, credit manager; and Ivan Conwell, manager record department. — Staff grows

Allen B. Carpenter has been elected president of Denver Pot and Kettle Club; Lou Golm, G-E Supply, first vice-president; W. G. Clive second vice-chairman. — P & K

The Electrical Housewares Gift Campaign for May and June did some good, though not all that was hoped. A late start and few major industry-wide campaigns at the local level were perhaps to blame too. — Gift drive

A "Bride's Gift Book" idea, suggested by Clif Russell, American Beauty representative, was put into effect by Kaemper & Barrett, distributors. Dealers contacted all brides through society column announcements, set up a "bride's book" list for them of gifts they'd like so their friends could come in, check and buy. — Bride book

Hard working Oscar G. Thompson, manager of G-E Supply in San Diego and past president of Bureau of Home Appliances, died last month, only 53. He'd been 28 years with G-E. He is to be succeeded by "Boo" Hoff, well-known in San Diego appliance circles. — Mourn a leader

Ward R. Schafer answered the call of the West, leaving vice-presidency of Coolerator in Duluth to manage a new distributorship, Schafer-Wright, Inc., at 1233 N.W. 12th Ave., Portland. The former Hotpoint vice-president is partner with Stanley Wright of British Columbia, a distributor there for 20 years. Firm will handle Coolerator, Hallicrafter and Laundry Queen in Oregon and southwest Washington. — Hot to cool

Los Angeles Furniture Mart has been working like mad to get approval of NPA as well as Prudential Life Insurance to get started building a more colossal Mart there. Original figure of $6 million won't be enough to build it now. Summer market at present Mart is July 9-13. It is said all markets this summer may be "lookers" markets. — Ambitious L. A.

Peter Prussing, formerly with Landers, Frary & Clark in Los Angeles, has joined Graybar Electric as supervisor of Gibson and Whirlpool sales under D. H. Capalli, district appliance sales manager. — Moves over

To succeed Dale Johnson, called to active duty in the navy, Allan R. Hill, native of Boise, has been made representative for Maytag in Salt Lake City area by Herbert W. Hall, Maytag Northwest Co. of Portland. — Fills gap

ZCMI Wholesale Distributors holds a grand opening of the new display rooms, offices and warehouse at Industrial Center (former Remington Small Arms plant) in Salt Lake City, June 12. Wholesalers of everything from drugs to doorknobs, including appliances, this oldest distributor in the mountain region is also one of the largest. — Celebrates

Deepfreeze held open house showings of its line last month at Portland, Stubbs Electric Co.; Spokane, Tubbs Electric; and Seattle, Northwest Appliance Distributors. — Showings

Leo J. Meyberg Co. has been appointed a distributor for Universal — Appointed

(traffic) appliances by Landers, Frary & Clark in San Francisco area.

Whether it was used to unload too big inventory or means a continued campaign to nullify Fair Trade pricing, Macy's and Gimbels and other New York big stores started a price war on fair trade items, including appliances, that almost pushed the Korean "police action" off the front pages. Los Angeles and San Francisco were on the verge of having one too. Meanwhile manufacturers were girding for the battle by refusing the price-cutters more merchandise and signing up all dealers to hold the line. The Supreme Court itself recommended that the Miller-Tydings Act be amended to cover nonsigners and efforts will be made to get Congress to do that. Meanwhile state fair trade laws are in effect and a dealer can sue those who cut prices claiming damage to him. Likewise selling below cost can be prosecuted. The price war is disturbing but will probably bring action faster to strengthen the laws which were designed to protect small dealers from ruthless big ones.

Unfair price war

While CBS won a Supreme Court decision to go ahead with its color-wheel TV and may push the introduction of it in the East, wartime restrictions on materials and a disinclination on the part of any other network to bother with a mechanical system like that will probably hold back much chance of its finding its way West for a long time.

Green light

Market dates have been switched a bit to avoid conflicts. San Francisco Market dates remain July 16-20, but Northwest Furniture Market changed from July 9-13 to July 23-27 to avoid Los Angeles Market dates of July 9-13. From an appliance standpoint the San Francisco market will have more to show. Interesting will be to see what the materials restrictions have caused manufacturers to do in the way of alternate materials and redesign. Lamps, as usual, will be "hell fer purty but not fer light." Everything points to emphasizing style and color in everything to make up for lack of metal.

Market dates

NARDA will hold its mid-year meeting in Chicago at the Stevens, June 24, during the time of the Chicago market. An impressive program of speakers, including Carl Haecker, RCA; Ben Gross, Gross Distributors; W. W. Cone; A. L. Scaife, G-E; W. A. Blees, Crosley; Anthony Wright, Capehart-Farnsworth; and NARDA President Mort Farr, is scheduled.

Chicago meeting

Allied Mfg. Co. of Seattle introduced a Kit Cat Clock of Beetle plastic to sell at $13.95 for children's recreation or bedrooms.

Timely

Silex is featuring a five-piece set of glassware in combination with its coffeemaker, Mixie for frozen orange juice and three Fresherator refrigerator containers, packaged as the Magic Savor set for gifts.

Gift set

Harold Green, of G-E Lamp's advertising division, talked to groups of lamp dealers and distributors and utility people and showed the movie, Father Sees the Light, in San Francisco and other Western cities on his return from the NWEL&P meeting in Portland. Told of the program for light conditioning model homes, lighting recipes, etc.

Home light

Motorola has introduced its new 1951 line of portable radios in three basic sets made in either maroon or forest green color, ranging $29.95, $44.95 and $49.95, using either a.c. or their own batteries.

Three

Telechron, Inc., becomes a department of General Electric Co., instead of a manufacturing affiliate, as of June 30. It will become part of the appliance and electronics group. The move will make no other change.

Absorbed

ELECTRICAL WEST Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

Boom to bust

The building industry is grinding to a slow stop. Even now the momentum has really gone out of it. There are many tracts frozen by the credit restrictions where construction has stopped right in midstream. Instead of the 800,000 units the planners said would be built, the rate has slowed down to less than half of that, most of which have already been built the first half of the year. It is getting rough for contractors who depend on the house market for survival. With clamps on commercial new construction, that, too, is slowing down.

Copper Stopper

Congress passed the act to remove the 2c a pound import tax on copper but it won't make the domestic price drop. It is being allowed to Chile as an extra inducement to produce more copper and ship it in to US markets to relieve the shortage.

Still in the mill

No construction price regulation as such had emerged from the regulation mills in Washington up to printing time although there were signs that one was being fabricated. A false start was made with CPR 34 which applies to repair shops, such as radio and appliance service. But so far there's no authority to pass on even the wage increases, let alone any overhead on them.

Pricing books

Pricing services, such as Biddle Trade Bureau, A. E. Rowe Co. or Henderson-Hazel, if used consistently in the past for pricing, seem to be acceptable, according to several OPS speakers, providing also that those services list prices that were prefreeze date.

Fog clears

Although considerable literature has been issued by government agencies about CMP it still has to July 1 to go before final details are set and the thing starts. So far copper wire is the only controlled material mentioned. The distributors are told to get wire by NPA directive. They are not to extend ratings or allotments from customers to replace inventories. There is no CMP rule on construction as yet nor on MRO telling how to get materials. Up to July 1 it is still the DO system.

Appetizer

Southern California hopes to give home building a shot in the arm with its 1951 Home Show, at Pan-Pacific Auditorium, June 14-24. All the gimmicks to pull the crowds are being used including queens (model girls), the Southlander (a model home) and a model B-29. Appliances will share attention with home building materials.

Gets okay

Salt Lake City commission finally gave its okay to a new electrical ordinance, ending several months of discussion over the drafts that were proposed. Controversial item was whether an inspector could engage in any outside business in the same field as that for which he inspects.

Renew

California State Contractors License Board set $7 as the renewal price for licenses, due June 30. The board sets the rate between $3 and $10 in any year, depending on its costs of operation.

Law changes

Some 29 bills to amend the California Contractors License Law were introduced at the legislature, most of which died on the vine. The most serious threat to building laws existing is a repealer for the bidders listing law, which protects subcontractors by requiring a general contractor to list the subcontractors from whom he received bids for state or public works. This is being opposed strongly.

West covered

Two top A-W emissaries from the National Adequate Wiring Bureau, Miss Frances Armin and O. C. Small, toured the West in nonoverlapping loops last month. Miss Armin made the Northwest loop, attending the Northwest Electric Light & Power Assn. Business Development Section meeting in Portland en route, while Small took the low road through the south, catching the PCEA convention in Los Angeles.

Coloradan

Simon Halle, outstanding electrical contractor and dealer of Colorado Springs, was named by NECA to be its representative on the National Adequate Wiring Bureau executive committee.

Modernize

Montana Power Co. has been relighting its general offices in Butte and is using the fixtures of manufacturers that have local representation. These include Columbia, Sunbeam, Ruby, Mitchell and Miller. Similar modernization is being undertaken for the Great Falls, Livingston, Lewistown and portions of the Bozeman and Billings offices, according to John Cromer.

New plant

Square D Co. held open house for the opening of its new branch plant and warehouse and office in San Francisco at 211 Industrial St. Ray Anson, local manager was host and Joe Pengilly, vice-president and general manager from Los Angeles, was honored guest, May 11.

Heat treat

Westinghouse announces a new 20-kw radio-frequency generator for dielectric heating of a wide variety of nonmetallic materials. It is adaptable for either batch or continuous production methods. Has simple operaing controls and is easily adjusted.

Explains changes

Analysis of the 1951 revisions to the National Electrical Code written by Arthur L. Abbott is being printed by the National Electrical Monufacturers Assn. and will be available at 25c a copy. A revised edition of Abbott's National Electrical Code Handbook is also in preparation by McGraw-Hill Book Co. and will soon be out.

Flexible centers

Trumbull Electric Mfg. Co. declares that the packaging of its new line of Trumbullite Load Centers enables the contractor and distributor to maintain a complete range of breakers for residential and commercial applications at a minimum of outlay. Three basic packages comprising nine box sizes are all that are needed for what used to take 900 catalog numbers and items.

Persuader

"Lighting and the Nation's Welfare" is a new 24-page report, in five sections that has been prepared by the National Information Committee on Lighting to summarize the vital service that illumination plays in industrial production, public safety, research, education and government. It is available at 15c a copy (less for quantities) from the committee at 1410 Terminal Tower, Cleveland.

Light center

A "lighting mobilization center" was opened at Nela Park, May 2, by G-E Lamp Department, with Hank Chanon, once engineer in Los Angeles, now manager of the Lighting Institute, in charge of it too. With characteristic G-E Lamp showmanship, as well as engineering, it is fitted to demonstrate all the factors and facilities involved in lighting for war mobilization or production. A street lighting conference held there May 8-9 drew many of the West's street lighting engineers.

Moves

Cam-Stat Inc., maker of regulators, thermostats and such, has moved to new and larger quarters at 11833 West Olympic in Los Angeles.

Date

District 8 of NECA holds its annual gathering at Billings, Mont., on June 22-23. National leaders will attend and give the latest on Washington materials, price and procurement regulations.

Restrain

A court decision recently in California restrains Jack Becker and William Gruen from using the name General Lighting Co. of California. These former employees of General Lighting Co. in New York previously represented the New York concern, then set up their own company.

Emergency ruling

New California Safety Orders, still not emerged from the press, do not permit an emergency service tapped on the line side of the main service switch. The order also contains definite rules regarding emergency lighting where it is required by any governmental agency. These rules have been demanded in the National Electrical Code by California inspectors for years and constitute one of the main additions to NECode rules to be found in the Safety Orders.

Youth program

"Living With Light" is the title of a new program of educational materials for teaching about light and sight in Junior high schools. It is released by the Better Light-Better Sight Bureau, 420 Lexington, New York City.

Little Change in Water Situation

May 1 forecasts of 1951 water supplies for Western States promise to depart but little from the April 1 forecasts published in ELECTRICAL WEST last month. According to the latest snow survey information released by the Soil Conservation Service and its cooperating agencies, the Northwest may still expect adequate and perhaps excessive runoff in a few localized areas, and the northern tier of intermountain states also will fare very well for water. The southwestern drought was not relieved during April.

Sectional forecasts based on May 1 snow survey data are:

Columbia Basin — Above normal snow pack that existed at the end of March has been considerably reduced, particularly at lower elevations by high April temperatures. These high temperatures probably have been accompanied by high evaporation losses. This, together with abnormally low precipitation during April, will result in runoff somewhat less than that forecast April 1.

The water supply outlook for irrigation and power remains good to excellent throughout the basin.

In general, snow cover throughout Columbia Basin is still above normal, although proportionately lower than on April 1 due to the warm, dry spring prevailing to date. Potential high water on the Kootenai, Methow, and Okanogan rivers was reduced by the high flows during April. However, these rivers may still rise to dangerous levels.

With the exception of western Montana, valley precipitation throughout the basin was far below normal for April, which reduces the seasonal volumes of water forecast on April 1 by about 6%.

A heavy storm April 28-30 deposited twenty to forty inches of snow on the higher elevations and eight to ten inches of snow at lower elevations in western Montana. The Flathead River should flow about 150% of average during this season. The Clarks Fork River should flow at least 130% of average. These flows will be less than in either 1950 or 1949. In the Upper Columbia River basin of Montana, water supply for irrigation and power will be sufficient for all needs.

Upper Missouri—May 1 snow surveys on the Upper Missouri and Yellowstone rivers in Montana indicate an excellent irrigation water supply for this coming season. The May 1 snow pack on headwaters of the Yellowstone River is above average and a good water supply is anticipated for the Yellowstone Valley. May-September flow at Corwin Springs should reach 1,770,000 acre-ft or 7% above the 10-year average. Snow pack on the Jefferson is heavier than last year, while on the Madison and Gallatin it is less than last year, but slightly above average.

Snow surveys on the Musselshell and Judith rivers indicate runoff slightly below average in prospect. However, spring and summer precipitation play a very important part in the water supply from these midstate mountain ranges.

May 1 snow surveys on the Wind and Popo Agie river basins indicate a good water supply for those basins for this season. The Wind River above Riverton is likely to produce a record year's runoff. Reservoir storage on Missouri River in Montana is good, along with the storage in northern Wyoming. Those portions of eastern Montana not supplied by snow-fed streams are beginning to feel the effects of the deficient precipitation over that section during the winter and spring months. The October-April precipitation over eastern Montana is 63% of average.

Rocky Mountain States—Colorado water supply outlook has not changed materially since April 1. The snow cover on the South Platte remains great. In many cases the snow cover is greater than any since snow surveys began. The southern part of the state continues definitely deficient in snow. Stream-flow throughout the area is generally below normal because of delayed snow melt.

Snow cover on the Green River in Wyoming is as great or greater in some cases than last year when it reached record maximum. Precipitation during April approximately was normal in the high watershed of the Snake River in western Wyoming. No change in the seasonal runoff as forecast on April 1. Good water supplies are forecast for the Jackson, Wyoming area and adjacent lands below in Idaho.

The water outlook for Rio Grande in New Mexico continues to be critically poor, with practically no snow and well below normal precipitation during April.

Intermountain States — In general there is no major change in the water supply prospect for Utah. The first half of April was dry with high temperatures which accelerated streamflow. About mid-April, cool temperatures, still continuing, reduced streamflow so that runoff for April has been only normal or below, even in areas where total seasonal runoff is still expected to be considerably above normal. Precipitation for April as a whole was normal or above.

May 1 measurement of key snow courses indicates that very damaging peak flows may still occur in northern Utah.

In Southern Utah, high precipitation at the month's end only slightly improved water supply prospects. Streamflow here will still be near a record low.

The drought in central and southern Nevada continues. There has been little improvement during the past month in the outlook for irrigation season water supplies. Above normal mountain snowfall during April has very slightly improved the prospects, but in all areas except for Humboldt Basin snow water conditions on May 1 were far below normal. Cool weather during April and above normal precipitation in valley reduced the April demand for irrigation water.

Pacific Coast—Marked lack of rainfall and abnormally heavy snow melt and snow evaporation during April reduced prospective runoff for most of Oregon's streams. However, most of the state can still be confident of good water supplies, although late season deficiencies of water are now expected on many small streams deriving supply from low elevation watersheds. Water stored in reservoirs is 5% above average for May 1, but in a few important reservoirs supplies are below normal.

The over-all April-July streamflow expectancy for California, as a result of observations of snow courses, precipitation, temperature and antecedent runoff made during April, shows that sufficient irrigation water will be available on the main stem of the Sacramento River; while on all of the rivers to the south, deficiencies will occur. On the Kern and Kaweah, the water deficiences will be the greatest of record.

Southwest—The water supply outlook for Arizona has not improved since April 1. Combined total reservoir storage is 2% less than a month ago, the combined storage being 5% of capacity or 170,000 acre-ft. However, because of general mountain snowfall near the last of April in one large storm, the forecast of February-June inflow to major reservoirs is increased from 140,000 to 150,000 acre-ft.

No change is reported in water allotments for 1951 in Gila and Salt River projects, nor in the acreage being seeded. Salt and Verde rivers still flow close to their minimum base.

ELECTRICAL WEST

Why Conventions?

IN the five weeks preceding the publication of this issue the editors attended 16 major industry meetings. Geographically they ranged from Portland and Wenatchee on the north to San Diego on the south, and from Denver and Billings to the West Coast. In size they ranged from a regional inspectors' gathering of three dozen in the Mountain area to 1,100 at the annual PCEA convention at Los Angeles. In interest they covered every branch and every facet of the electrical business. And in total they involved well over 2,500 men and women.

Viewing this there are those who would say "here is a great waste of time and energy; what good could possibly come from all this meeting and talking?" Those of us whose business it is to go and listen and to refine, condense and report are best able to answer such critics. Without these conventions there could be none of the personal and intimate exchange of the accumulated "know-how" of the industry. It is at these industry gatherings that the experience, knowledge and opinion are exchanged so that all may benefit and profit from the combined sum of wisdom, learning and practice. Supplementing this formal exchange, there are the friendships, newly made or renewed, which serve as future source of interchange of knowledge.

The editor's task is to select and condense from all that passes, those things worthy of the record. Thus those who by the nature of their responsibilities are tied to desk or task or machine may sample the accumulated wealth of experience and profit therefrom.

Congressional Intent

UTILITY regulatory commissioners are required by law to work always in the public interest. Hence the declaration by the Mountain-Pacific States Conference of Railroad and Utility Commissioners for the 11 Western states that the "preference and priority" exercised by federal agencies in selling government electric power works a great hardship on the general public is of interest. Here is the group's resolution:

"Whereas, provisions contained in various federal statutes give preference to public bodies and cooperatives in the sale of electric power produced at government power plants, which preferences unjustly discriminate against numerous citizens and electric users who are served by electric utility companies under state commission regulation, and;

"Whereas, such preferences have been and are being used to foster and expand public power to the detriment of the customers of regulated utilities, and;

"Whereas the benefits of power produced at federal projects should be made available to all users of electricity on equal terms;

"Now, therefore, be it resolved that the Congress of the United States be urged to adopt a federal power policy which will make power generated at federal projects available to all citizens and users without discrimination, and that the provisions contained in existing statutes relating to the disposition of electric power and energy from federal projects be rescinded."

The commissioners in decrying this present unfair policy stated something which most Westerners realize. They said that "unless this trend is halted, socialization of a large part of the industry in the West will be the inevitable result." We cannot believe that this was ever the intent of Congress.

Seawater Irrigation

WITH agricultural development of the arid Pacific Southwest tied definitely to water, there is reason for the region to heed a suggestion made by a scientist to a joint gathering of scientists and engineers just the other day. Why waste any further time and effort on plans to desalinify the ocean water so that it might be used for irrigation he asked? Instead he proposed that research be undertaken on the development of useful plants that would thrive with the direct application of seawater for irrigation. He pointed to the lush botanical growth ever present in the ocean now as an example of what might come from such research. The idea has merit.

EDITORIAL VIEWS

To Stop is to Slip

PROUD of its high electrical consumption per domestic customer and high appliance saturation the Pacific southwest must take another look at itself lest it slip behind quite seriously as compared to other sections of the country. It is an old truism that he who stands still soon finds himself slipping backward.

That this was happening to the California, Nevada, Arizona area was pointed out to the Business Development Section of PCEA by one speaker whose long experience in the appliance industry establishes his authority to do so. He showed that while the national saturation of electric ranges has moved up to 20.99%, the saturation in California is still 10.26%, in Arizona 11.28%. Nevada alone is still higher, with 54.36%. Among the factors affecting this ratio is that the southwestern states have had a 63% increase in wired homes to a national percentage of 52. But the rate of sale of ranges for the country is higher than for the West—272% against 193% and now, out of ten geographical districts in the U.S.A., the southwestern states are fourth in number of electrical customers but only ninth in range saturation.

To be sure there are reasons. The states of California and Arizona are served with cheap natural gas and are likewise the most actively cultivated market for bottled gas. There have been some dry years when power shortages discouraged sales effort. But there is surplus power now and likely to be for sometime to come. The chief reason, perhaps, has been lack of energetic range promotion. Electric ranges have been selling themselves. Rather, people have grown to want them enough to demand them from dealers in spite, sometimes, of discouragements and high installation costs.

With a war on and production controls on appliances there is grave danger that electric ranges will receive another setback unless utilities, whose interest is longest ranged, do some active promotion again, whether they have any ranges to sell or not. It is an investment in the future as well as insurance against losing existing load.

LAST week there came to our community some federal office holders to threaten us with further inflation; to blame the people for its existence; and to ask the people to do something about it. That highly misleading party line out of Washington simply must not go unchallenged. Who is it that has controlled and made monetary policy in this country for almost twenty years? Who devalued the dollar? Who has engaged in enormous deficit spending? Who has turned debt into phoney money? Who has controlled and priced our basic commodities? Who has engaged in price-fixing at levels above free market levels? Who has wasted and destroyed great quantities of our butter, eggs, cotton, potatoes and grain? Who has encouraged individual spending by repeatedly telling people that they are entitled to a higher and higher standard of living while our debts remain unpaid? Who actually classified thrift and conservatism and frugality as an economic sin, while encouraging prodigality and self-indulgence? Who still maintains the greatest body of jing-doodling office holders in the history of the world on a business-as-usual basis, while at the same time appealing to local, city, county and state governments, and to business interests to conduct their activities on a severe austerity basis? Who is it that for years has been engaged upon the most wasteful, profligate, costly and inflated government in the whole history of mankind? You know who it is: Our federal administration since 1932. For nearly 20 years they have mothered, and reared, and fed and encouraged inflation, and they continue to do so, and no manner or quantity of words or speeches can absolve them of their responsibility. Let's keep the record straight.—Harold Quinton, executive vice-president, Southern California Edison Co.

Gadsby Bankus

Kirk Purton

Duffy Sawyer

Gadsby Flays Interior Spending

Engineer group is told $173 million could be saved by elimination of duplicating, nonessential federal spending

Elimination of duplicating, nonessential spending by the Department of Interior's Bureau of Reclamation would save $173 million of taxpayers' money, declared George M. Gadsby, president of the Utah Power & Light Co., in addressing the meeting of the Engineering and Operating section of the Northwest Electric Light & Power Assn., held in Salt Lake City, April 25-27. Not one penny of tax money should be spent to contribute to socialistic plans at home when money, resources and lives are being so freely spent to fight a war against communistic, socialistic imperialism abroad, he said. Almost $1 in every $7 of the $150 million Reclamation Bureau budget for power during the 1952 fiscal year can be saved if the bureau drops its schemes for an unnecessary and duplicating nationalized power system, he believes.

As an example, Gadsby said, the bureau is asking Congress for $1,300,000 to start a $6,600,000 hydroelectric plant at American Falls, Idaho, where the Idaho Power Co. already has a plant in operation. Since there isn't enough water in the river for two plants at the location, the company plant would be forced to close down. Over in Colorado, he continued, the bureau wants to build all the transmission facilities from its Colorado-Big Thompson project, although $330,000 of tax money could be saved by cooperating with a private utility and utilizing some of its lines and service.

"The Department of Interior's approach to its federal nationalized power system has been one of piecemeal, foot-in-door tactics to obtain a multipurpose dam here, a transmission line there, a steam plant somewhere else, all built to an over-all plan of socialization." The Congress should reject proposed outlays for new federal power facilities where private companies are willing and able to do the job, declared Gadsby.

In response, Cecil Kirk, Montana Power Co., said private enterprise has a responsibility in preserving a free Christian nation and the engineer has a responsibility to help preserve our freedom. Material allocation under DEPA was discussed by C. T. Hurd, chief, materials and equipment section, who made a special trip to the meeting from Washington. He said that of 49 million pounds of aluminum allocated for the second quarter, 14% would go into conductor. Copper became a program material on April 9. Ninety-two million pounds of copper was set aside for the second quarter and most of it will be delivered. For the aluminum accessory program, 2½ million pounds have been allocated and he said that a directive just issued would permit aluminum accessory manufacturers to fill orders under DO 48 minor, or with no DO at all. This straightens out a bad situation that did not provide a user of aluminum conductor with the accessories to install it. Hurd said that the Controlled Materials Program (CMP), due to go into effect July 1, will give whole projects a blanket rating for all materials, equipment and component parts, and thus assure keeping large and important power projects on schedule.

Sprinkler irrigation was given prominent place on the program of the utilization committee under M. D. Duffy, Pacific Power & Light Co. With Dean F. E. Price, Oregon State College, as moderator, some interesting statements and facts brought out were: Sprinkler irrigation is going to be big business and an important power market; real growth of sprinkler systems has been since 1946 with the advent of aluminum piping; much land that is going out of use from alkali and waterlogging can be saved by sprinkler irrigation; water can be conserved; the system has the big advantage that fertilizer can be run through the sprinklers; water economy can pay extra power bill; Portland General Electric Co. has 5,000 hp in sprinkler load yielding $10 revenue per acre per year; acreage has increased from 30,000 in 1946 to 400,000 acres in 1950, ¼ to ½ hp per acre is required for sprinkler pumping.

Preferred voltage standards proposed by NEMA, EEI and AIEE were presented by J. H. Steede, B. C. Electric Co. It was felt that the subject was sufficiently important to be carried over for further discussion next year by the group.

T and D Committee

Quite a discussion took place in the transmission and distribution group on the problems encountered in converting 2.3-kv circuits to 12.5-kv wye. C. L. Brown reported for Pacific Power; W. B. Smith for Idaho Power. Careful engineering, planning and coordination are essential for smooth working and a minimum of inconvenience to customers. Backfeeds are the worst hazard.

Use of Triplex aluminum conductor for services and secondary was discussed by S. J. Pearson, Portland

Jagger Arnett

Noon Maddox

General Electric Co. Triplex is a loosely stranded all-aluminum cable with two insulated conductors and a bare neutral. Savings of about 15% can be made for No. 4 aluminum services, as compared with three No. 6 copper open wires; $1 can be saved in house attachments alone. PGE is also experimenting with No. 2 aluminum Triplex supported on a steel messenger for secondaries. This permits omission of center block poles at a saving of 45% in construction costs.

Methods of testing pole butts with increment borers and torque screw pole testers that give a graph of the pole condition were reviewed by O. D. Lanning, California-Pacific Utilities. Several companies think it is a good idea, but Washington Power reported having abandoned such devices as impractical. Portland General Electric reported satisfactory experience with the osmoplastic pole testing and treating service rendered by the Kamphausen Co. of Denver. In any event, it was stated, a utility must replace 2% of its pole plant per year if it expects to maintain its poles in safe condition.

Electronics

An overflow attendance showed the great interest in the electronic equipment committee meeting. It is feared that a million-watt short-wave transmitter, to be installed by the Navy near Arlington, Wash., may make power line carrier on the Northwest Power Pool partially inoperative. There are not enough channels to go around with all the requirements of the Northwest Power Pool unless frequencies above 150 kc are used, it was stated. Solution was said to lie in greater selectivity on voice channels; improved deviation of transmitters; reduced power from 100 w down to 25 w; and use of microwave.

It looks like radio is going to have to take over much of the communication job in view of this large Navy transmitter, said W. A. Leidigh Jr., Portland General Electric. He reported that 77 utilities in the Northwest now have 218 land stations and 1,804 mobile units and that some 700 more mobile units are licensed.

Microwave is advancing rapidly and offers the solution to many of the utility's communication growing pains, said Ralph Maddox, Federal Telephone and Radio Corp. We are doing the same thing as radio, he said, but it has been repackaged and made smaller. Because of low channel cost and almost 100% reliability of operation under all conditions, Maddox predicts that microwave will almost completely displace toll lines in open country in the next few years.

Under chairman Waldo Enns, Portland General Electric, the electrical equipment committee went into substation designs for economy and reliability. Speeding up of relays, faster reclosures, supervisory control; use of beamed radio control for switching; duplex unit substations; standard design for flexibility; use of 3-phase transformers; overhead in place of cable get-away; direct burial cable for control wiring; and mechanized tools were mentioned among equipment and methods for reducing substation costs and improving customer service.

House Heating

At the meeting of the house heating research committee, three papers were presented adding further information on this important topic. Clarence Boggs, Idaho Power Co., reported successful operation and customer satisfaction with 24 heat pumps operating in the Idaho territory. Ted Brown, Refrigeration Distributors, Salt Lake, described the unique heat pump installation being made in the new service building of the Utah Power & Light Co. The building is adjacent to the new Gadsby steam plant. Condenser discharge water is used as the heat source in winter, and for summer cooling water is taken from the cool side after having left the cooling towers. R. E. Sinclair, Pacific Power & Light, coordinated data from steam heating tests, gas heating tests and published data on electric house heating tests to come up with a formula by which coincident demand for electric house heating can be determined if outside temperature is known.

Next year Cecil Kirk, Montana Power, will take over as chairman and Tom Purton, Utah Power, as vice-chairman of the engineering section. A vote of appreciation was given John Bankus, present chairman, for his stewardship during the past two years.

NECA Dist. 8 Plans Billings Meeting

Late news of the materials and regulations situation direct from Washington with an opportunity to discuss these from the standpoint of the electrical contractor's business with other contractors will be the chief reason some 200 contractors from Colorado, Utah, Montana, Wyoming and Idaho will gather at Hotel Northern, at Billings, Mont., June 22-23 for the annual District 8 meeting of National Electrical Contractors Assn. R. D. Rowe, Great Falls contractor and president of the Montana Chapter, and W. E. Blackmar Jr., manager, and Matt Sherwood, field representative of NECA, San Francisco, are arranging final details of the program.

From NECA in Washington Paul M. Geary, executive vice-president; E. R. Cornish, director of research and education, will attend and speak. W. C. Wright, vice-president IBEW, District 8, is also scheduled to speak, as is Donald Larson, manager, Rocky Mountain Chapter, Denver, and Sherwood from San Francisco. A plane load of Colorado members is expected from Denver. Reports of activities of the Utah-Idaho Chapter, by its manager, G. A. Howarth, Salt Lake City, will also be made. Other industry and governmental speakers will be on the program to bring views and participate in discussion of interrelated problems.

The Montana Chapter, host to the meeting, is planning the entertainment program for the contractors and their wives who attend the conference.

Kelley Davis Bragg Delzell

Developers Rarin' to Go

NWEL&P Business Section holds exceptional conference in Portland

There isn't anything basically wrong with the electrical industry in the Pacific Northwest that 1,000,000 kw of spare capacity will not cure. As their contribution to the achievement of that millenium, the 11 privately-owned utilities in the area are spending $581,750,000 during the next five years on system improvements which will include the installation of 1,356,000 kw of new generating capacity.

Both of these facts were brought out at the annual sales conference of the Northwest Electric Light & Power Assn. held at Portland, Ore., May 7-9, with 250 in attendance. George T. Bragg, vice-president and general manager, Pacific Power & Light Co., made the first statement to give substance to his assertion that an intelligent customer sales call is the best form of public relations activity. The second fact was brought out in an unprecedented financial clinic sponsored by Thomas W. Delzell, association president.

Financial Clinic Sets Precedent

The financial clinic brought together Northwest utility executives and security analysts from New York, Boston, Philadelphia, Chicago, Montreal, Los Angeles, San Francisco, Seattle and Portland for a discussion of utility financing. In reporting on the Northwest situation where federal government power activities have long held the public spotlight, the executives each outlined his own company's 5-year expansion program and Allan A. Smith, utility attorney, who acted as moderator, summarized the presentation (see pages 76 and 77).

By way of establishing a foundation for the financial clinic A. E. Grauer, president, British Columbia Electric Co., declared that the pattern of utility capital reflects such characteristics of the business as its stability, regulated operation, large capital requirements and revenues. He said a conservative capital ratio consisted of 55% bonds, 20% preferred shares and 20% common.

Complexities of utility financing were discussed by E. E. Beckett, treasurer, Pacific Gas and Electric Co. He explained that in that company's $800 million expansion program it had gone to the SEC 14 times in 4½ years in connection with 13 offerings involving $580 million of new capital. PG and E, he said, today has an installed capacity greater than the total of Bonneville, Grand Coulee and Shasta. Bonds have been sold at competitive bidding and preferred shares on negotiated sales. Present income tax schedules favor bonds as a means of securing capital, he declared, because 50% of net income is required for taxes.

Analysts commenting upon financing problems urged that present conservative capital ratios be maintained and warned against seeking easy funds through mortgage money rather than through equity capital. They suggested relief through higher rates if equity capital could not be attracted by present earnings. R. W. Lambourne, executive vice-president, National Federation of Financial Analysts Societies, said that analysts want a continuous reporting of timely information and more personal contact with utility managements.

If a few ambitious people in government would drop their notion of establishing a federal power monopoly in the Pacific Northwest, the municipal and private utilities might be able to cooperate more fully with federal agencies in providing adequate electric service in the region, President Delzell told the conference. A federal monopoly might impose many of the abuses attributed to holding companies, he declared. A federal power policy confining the federal government to constitutional responsibilities would materially clarify the difficulties which have precluded the negotiation of long term contracts between the utilities and Bonneville, he insisted.

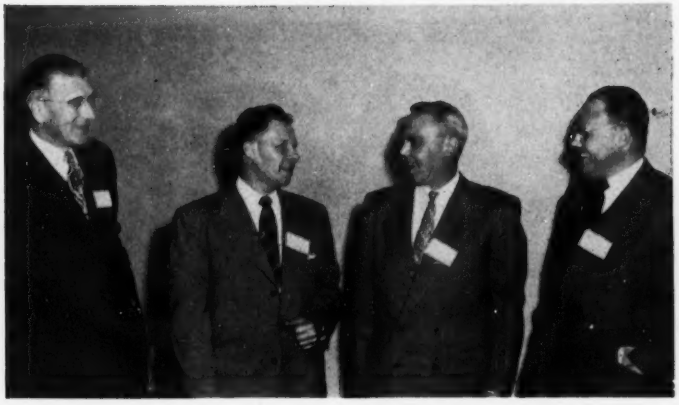
Utility Leadership Urged

In the conference keynote sales address H. M. Kelley, Frigidaire appliance sales manager, appealed for greater utility leadership in the electrical market place. He defined leadership as "having the courage to do what you know is right and being willing to accept the consequence."

"From an economic standpoint, leadership is the opposite of security," he said. "It pays good dividends if you win, but you will never become a leader if you always look for security in everything you do. If a person wants perfect security all he has to do is to go out and commit some crime just short of murder and he will be put in the most secure place in the world—prison. He will have his food, his clothing, his shelter—absolute security for the rest of his life. But, he won't have any freedom and he won't have the opportunity to do any leading or have anything to say about where he is led."

A good example of where leadership can be applied in the appliance field is in the promotion of the electric clothes drier, Kelley said. "This appliance is today's fastest growing electrical household device. Had the public utilities been able to start promoting its sale five years earlier than they did, instead of having 425,000 electric driers in use, 260,000 of which were sold last year, we would have millions of electric driers in use today. Many of you know of utilities who only recently have really gotten behind the clothes drier. They listened

Macleod



Gilbert Greisser Mayer Manson

too long to the engineers about load factors, transformer capacity, installation costs—all of which had not one single thing to do with whether or not it was a better way to dry clothes."

Program Has Diversity

Variety marked the sales and load-building subjects covered by the conference program. They ranged from community development, adequate wiring and lighting to an analysis of the competitive aspects of impending natural gas service for the area.

Various ways of using opinion surveys were outlined by Charles A. Parker, president, Central Surveys Inc. They can be used, he said, to determine opinions to project possible action; to determine reasons for opinions; to discover what theme might be most effective in influencing opinions; in the determination of population grouping where opinions vary and in making preference studies. He urged that utilities do not survey employee opinions unless they intend to recognize sources of dissatisfaction.

In urging greater activity in the field of community development by utilities, W. J. Ridout Jr., editor, "Electricity on the Farm," declared that such programs constitute a grass-root demonstration of the workability of the free enterprise system. He outlined several successful community development programs sponsored by utilities in various sections of the country. He suggested that utilities might well shape their policies so as to "be a small business in local communities, and not a big business over a large area. Mind your own business diligently and only then take an interest in developing business for the other fellow."

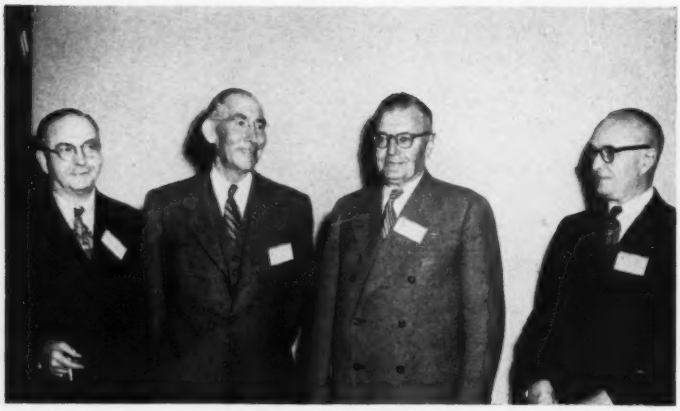
With natural gas service for the Pacific Northwest apparently assured for sometime within the next two or three years either from Texas or Alberta, utilities are beginning to size up the competition they will face. The coming of natural gas will help the electric business by attracting industry which, in turn, will bring new population and service businesses, according to J. F. Pollard, manager, commercial department, Pacific Gas and Electric Co. Gas, he said, will replace other fuels in a variety of steam and heating applications. In most competitive situations the customer will make the right choice, he said.

Harold H. Green, Lamp Department, General Electric Co., declared that one of the great challenges facing the electrical industry is the job of increasing national productivity by supplementing manpower with electric power. Good lighting can play a big part in accomplishing this, he declared. For proof he cited experiences with good lighting installations installed in World War II industrial plants. A feature of his presentation was the initial showing in the Pacific Northwest of the new G-E home lighting film "Father Sees the Light." The picture is based upon the application of light conditioning recipes.

Further proof that every branch of the electrical industry profits from the promotion of adequate wiring was presented by Howard N. Walters, general sales manager, British Columbia Electric Co., and president of the Electrical Service League of B. C. For proof he cited figures for two wiring layouts for identical homes, one layout using a 30-amp service and the second a 100-amp service. For the minimum job the contractor's material cost was $97.43 and his quotation for a complete installation was $192.18. The home was equipped with five appliances and three floor and table lamps. In the case of the 100-amp wiring job the material cost was $281.19 and the quotation for the job $472.72. Appliances included electric range, water heater, refrigerator and washer, eight small appliances, four radios and five floor and table lamps. Average appliance cost in the 30-amp wired home was $356 and in the 100-amp wired home, $1,756. Energy consumption for the minimum home was 107 kwh monthly and for the adequately wired home 630 kwh.

Declaring that adequate wiring represented the utility's biggest and best sales opportunity, Frances Armin, director of education and promotion for the National Adequate Wiring Bureau, listed these benefits to be derived from a-w promotion: (1) Customers who live in adequately wired homes enjoy the "best quality" electric service because their equipment works at top efficiency, (2) trouble calls and complaints are fewer in adequately wired homes, (3) a program of adequate wiring education and promotion sponsored by a utility company as a public service since the utility itself sells no wiring. Thus, such a program builds good public relations for the company, (4) adequately wired homes open the way for future loadbuilding and show a definite increase in revenues over and above the increases found in conventionally wired homes.

Gerald Maacari of the General Electric Home Bureau gave a striking demonstration of the advantages which home building contractors can get from pre-planned kitchens. He showed 14 different kitchen arrangements for a single basic floor plan, indicating the



Johnson McMicken Royer Meyers

Leonard LaMar

flexibility to be obtained with preplanning. He stated that builders can give the home buyer a variety of choices. He urged that the industry sell builders on putting fashion and romance to planned kitchens with color and knickknacks to give eye appeal and sales appeal. He also showed pictures of the "New World Kitchen and Laundry" which indicates kitchen planning and appliance design based upon plans being formulated for two or three years in the future.

In a dynamic business such as the electrical industry it is inevitable that no matter how courageous the predictions of future growth or how spectacular the progress in achieving the goal, the future will always hold out opportunities and potentials far beyond the fondest dreams, George C. Tenney, editor, ELECTRICAL WEST, told those attending the final conference lunch. He pointed up the benefits that each branch of the electrical industry can obtain through working together in an organization such as the association.

Sales Opportunities Ahead

"Have fun or get out of the business," was the admonition of Sam Vining, merchandising consultant, Westinghouse Electric Corp. He defined selling as "having fun helping people have fun getting the things they want and need through you." After approximately 10 years of no selling he declared that the electrical industry now has a great opportunity to go out and sell its wares. War and postwar customer wants are satisfied, he said, and now the customer is sitting back with money to spend and defying salesmen to get it away from him. Because so many of the present-day electrical appliances have new features that make their predecessors obsolete, Vining said that this industry has one of its greatest opportunities.

Rob Roy Macleod, vice-president, Niagara-Hudson Power Co., and chairman of the National Affairs Committee, Buffalo Chamber of Commerce, gave an outstanding address on "The American Package" at the annual banquet. Manufacturers and distributors entertained at a cocktail party one evening.

Each of the three bureaus of the section held discussion meetings during the conference. The Electric Home Bureau, headed by R. R. LaMar, Portland General Electric Co., featured planned lighting in the home and the planned laundry. The Adequate Wiring Bureau, under the chairmanship of A. S. Gilbert, Idaho Power Co., heard Frances Armin discuss success factors in adequate wiring promotion. The Rural and Farm Bureau, headed by A. G. Mayer, Washington Water Power Co., held a panel discussion on things business can do to assist agriculture in the Pacific Northwest. The Commercial and Industrial Bureau with C. A. Manson, British Columbia Electric Co., as chairman, discussed the EEI planned lighting program, commercial and industrial lighting developments, commercial electric cooking and potential competition with natural gas. A. H. Greisser, Portland General Electric Co., described a new infrared commercial cooking installation which will be described in a later issue of ELECTRICAL WEST.

Beckett

Rate Research Committee

Methods for forecasting economic conditions and trends with greater accuracy were discussed by the Rate Research Committee of the Northwest Electric Light and Power Assn. at Portland, May 7-9. Bjorn Gadeholt, Pacific Power & Light Co., chairman, and a group of rate experts from utilities in the area agreed that analyses based upon past performance alone were not sufficiently accurate.

Study of various economic factors in relation to kwh customer use indicates a close parallel between income and use curves, it was reported. Other subjects discussed were how to sell rate tariffs to sales departments and how to take the mystery out of rate schedules for the average utility employee.

IES

Oregon Section, on May 16, and Inland Empire Chapter, on May 23, heard George Smedberg, Westlight Co., San Francisco, discuss techniques for lighting dramatics in schools and colleges . . . Southern California Section had an industry-wide residential lighting plan discussed at its May 2 meeting . . . Northern California Section heard C. W. Butler, chief lighting engineer for Civil Aeronautics Administration tell of approach lighting in the U. S. and in the South Pacific.

Balzari

Goss

Elliott

Vining

Phillips Doerr Goodwin

Supply Paradox Concerns NAED

Conditions brought about in the electrical distributing industry by the accentuated national defense program took most of the attention of the NAED at the largest gathering of its kind during the long history of the Pacific Zone.

Nearly 300 electrical distributors and their manufacturer guests convened at Arrowhead Springs Hotel, San Bernardino, Calif., May 2, 3 and 4 for this annual Spring Convention of the Pacific Zone, National Association of Electrical Distributors.

The organization and the responsibilities of the Electrical Products Branch, Building Materials Division, National Production Authority, and what such an office means to the distributor of electrical supplies, was outlined to members and guests by Luther D. Shank, chief of the branch, visiting from Washington. Following his description of the methods by which this branch served to determine the needs and provide the materials for manufacturers producing electrical goods necessary to defense and to a defense supporting economy, Shank previewed the Controlled Materials Plan scheduled for July 1 operation. He said that under CMP, every effort would be made to keep a flow of goods to wholesalers "at a rate high enough to preclude any necessity for you to fill out forms to replenish your inventories."

At the opening of the convention, Fred G. Goss, past chairman of the Pacific Zone, and currently Western representative on the NPA Industry Advisory Committee, reported to members and guests on the problems that had come up at the first meeting of the committee in Washington in December, and told how the existence of the Industry Advisory Committee enabled the NPA to keep a finger on the pulse of the electrical supplies distribution industry, with resulting benefits to both the industry and the national defense program.

Bringing their relationship of the wholesaler and the NPA a little closer to home was William Pruitt of the NPA office in Los Angeles. He described the local setup, the variety of offices and their function, and detailed procedures by which wholesalers or their customers could contact NPA on problems relating to the supply of controlled materials.

Distributors and dealers should not be in a panic today because of high inventories of television receivers, said J. B. Elliott, vice-president of RCA-Victor, Camden, N. J., in his talk at the opening session. He ventured that "inventories will disappear much sooner than most members of the industry expect" because "although the demand for receivers will mount steadily, the production of receivers will not." Elliott reviewed the rapid growth of the television industry, pointing to its characteristic periods of giant strides interspersed with periods when the industry seemed to be marking time.

The noticeable decline in appliance sales since March can be attributed partly to the public's apathy toward "buying," said Sam Vining, merchandising consultant, Westinghouse, Mansfield, Ohio. The public has a rapidly increasing reserve of money, he pointed out, but it has grown reluctant to take it down to the dealer's store and slap it on the counter. Therefore, there is an unequaled opportunity for the retail salesman who will go out and sell, he observed. To start goods moving from the dealers' floors, manufacturers and distributors must go back to teaching the dealer and the salesmen how to sell, he advised. They must show the dealer how to analyze his market, how to go after it, and how to plan his selling.

As the closing speaker of the convention program, Dr. William C. Jones, president of Whittier College, presented an inspirational address on "Economic and Political Factors Today" in which he called for a re-establishment of human values and a revaluation of the material things for which people and peoples are striving today.

During the three-day convention, the NAED Pacific Zone members and guests enjoyed a varied program that combined the business meeting schedule with formal and informal gatherings, swimming and golf, the traditional "chairman's dinner" and the famous "golf banquet," and for some a sightseeing trip to mile high Arrowhead Lake.

Harry Gerster, GESCO, Los Angeles, assisted by Roy Kimberlin, Graybar, San Francisco, and Leslie Stusser, Stusser Electric Co., Seattle, made up the convention committee. The program committee was under the chairmanship of Charles R. Matthews, WESCO, San Francisco, assisted by Louis Kaplan, D. A. Smith, Graham-Reynolds, Los Angeles, and A. H. Meyer, Leo J. Meyberg Co., San Francisco. A. W. Rockwell, Appleton Electric Co., San Francisco, had charge of the men's entertainment program, and Mrs. Margaret Todt supervised the entertainment program for women. Pacific Zone secretary, R. A. Balzari, coordinated the convention activities.

O'Connor, Mrs. O'Connor, Newmarch, Mrs. Newmarch, Goold, Mrs. Goold, Merwin, Mrs. Merwin

NECA Measures Problems at Conferences

If the electrical contractors who attended either of the two district meetings in Phoenix or Sacramento last month came hoping to find clear paths out of the present confusion, they learned at least that they were not alone in the problems which face them. And they probably learned a great many details that may be helpful in the months to come.

The District 5 meeting was held jointly with District 7 of IBEW at the Westward-Ho Hotel, Phoenix, April 22-25 and presided over alternately by James McClure of Dallas, NECA vice-president of District 5, and IBEW vice-president W. L. Ingram. There were joint meetings of the two organizations and then during the afternoons each held their own separate meetings. Doubling as field representative for District 5, as well as national director of the line construction section, George A. Seaman of Fort Worth handled arrangements with characteristic flair. A large turnout of contractors, especially from Arizona and Texas, was augmented by industry representatives from the Phoenix area.

W. W. Arbogast, Newbery Electric Corp. of Arizona and acting president of the Arizona Chapter, welcomed the convention for NECA and Henry Van Ess, business manager of Local 640, Phoenix, welcomed the union representatives in attendance.

The first day's meeting was addressed by Governor Howard Pyle of Arizona; Dean R. J. Hannelly of Phoenix College; George V. Christie, a banker; William F. Patterson, director of the Bureau of Apprenticeship from U. S. Departmnt of Labor, and Henry B. Sargent, president of Central Arizona Light & Power Co.

Sargent stressed the interdependence of all branches of the industry in meeting the challenge to the nation presented by the mobilization program and the threat of war. He made a strong case for the benefits of teamwork between labor and management, linking their interests toward the same national goals.

The Tuesday meeting was largely a labor and management session. A. E. Edward, international representative IBEW District 7, and Vice-President Ingram presided. Ingram addressed the group on the subject of "Now Is the Time," stressing cooperation between the two phases of the business. Lawson Wimberly, assistant to Ingram, spoke on chapter and union cooperation.

A feature inspirational address was given by J. Scott Milne, secretary of the IBEW, Washington, D. C., and former westerner. Using a religious theme, "Were you there, When (They Crucified the Lord)?" Milne made an inspiring address on brotherhood and preservation of the freedom in the American way of life.

Sousa Cornish

H. L. Scott, chairman of NECA business promotion committee, held an afternoon session for contractors with a review of the promotion program of NECA as it has been adjusted to the defense program.

On Wednesday Harold J. Hill of Wichita, Kan., was chairman. George Roscoe, director of public relations NECA, outlined the government controls under which the contracting business must now try to operate. He had been preceded on Tuesday by Wayne Baskin of NPA who spoke on the regulations affecting the electrical contracting industry. Roscoe promised to keep the members informed by means of NECA's weekly newsletters, special bulletins, and interpretative bulletins from time to time on these defense orders.

E. R. "Al" Cornish, NECA director of research and education, who had conducted educational and estimating classes in the District in 14 of its chapters, brought the group up to date on the development of that program. The program encompasses six courses, namely, (1) Fundamentals of accounting for electrical contractors, (2) advanced accounting and financing for electrical contractors, (3) sales engineering, (4) estimating, (5) job management, and (6) business administration. He announced that enrollments in the fundamentals of accounting course would be accepted beginning

Geary O'Connor Seaman Sherwood

July 1 with the other courses available at intervals of 30 to 60 days apart. The estimating course may be made available prior to the one on sales engineering. He likewise outlined the steps to be taken by the chapters in carrying out the educational courses. Full details of this educational program will be carried in a later issue.

H. L. Scott reported on the business promotion committee's activities and George A. Seaman on conditions in various parts of District 5. The meeting concluded with a report on national affairs by Paul M. Geary, NECA executive vice-president. Meetings were also held, while the group was available, of the Southwestern Line Constructors Chapter, a chapter managers' council as well as a meeting of the governors of the various chapters in the district. On its part, the IBEW held a meeting of its financial secretaries. The wholesalers and manufacturers representatives, and utilities, joined the group and provided a buffet supper and cocktail party to conclude the successful meeting.

District 6 Meeting, Sacramento

Although less spectacular the meeting at Sacramento, April 27 and 28, of District 6 was likewise well attended. The district includes the states of Washington, Oregon, California and Nevada. As in the other district meeting, a board of governors' meeting was held on Friday morning. At the same time the chapter managers held a meeting. Later a meeting of the California conference of chapters was also held. J. D. O'Connor, Lupen & Hawley, Sacramento, vice-president for District 6, presided. The group was welcomed by James Newmarch, president of the Sacramento Valley Chapter. Roger Deas, secretary to Earl Warren, governor of California, spoke at the first luncheon and Dr. Tully Knoles, chancellor of College of the Pacific, gave a penetrating view of the world situation in an address at the Saturday luncheon.

A meeting of the Southwestern Line Constructors Chapter was also held with members of the Northwest line constructors in attendance.

Addressing the Friday afternoon meeting Paul Geary, NECA executive vice-president, discussed the new wage stabilization board being set up in Washington and announced that it would have a construction committee on it, to which a member of NECA would be chosen. He also mentioned the interpretation of the Taft-Hartley Act now being enforced by the NLRB which may put all of the building industry under its bargaining procedures and elections. The question whether to bargain locally, the chapter with the electricians of the community, or to attempt regional or national bargaining is something to be studied. It was also said that the national benefit agreement for electrical workers' pensions may need revision as the pension system of the union is not at present actuarially sound. With 4,000 on pension now and a potential 14,000 on pension in 1961, the union has increased its assessment per member to $1.60 per month and the contractors' contribution may need to be raised also.

Oscar Harbak, IBEW vice-president for District 9, told the group there were shortages of manpower in California while work is slacking off in Oregon and Washington. He admitted that the union is having difficulty in jurisdictional matters with some other crafts and that in order to retain jurisdiction it had been necessary to furnish men to general contractors rather than insist that the work be sublet to electrical contractors.

George Seaman, representing the national line constructors, spoke briefly advising formation of separate chanters for line constructors.

In his report on national and district affairs J. D. O'Connor said that the membership in District 6 was the largest in the nation but that in the dues paid it ranked fourth. He discussed the proposals being made to change national dues to a minimum of $50 per year with a reduction to .25% instead of .3% of labor pay roll. Ed Buttner, Oakland contractor, labor relations committeeman for the district, he said, was acting on behalf of NECA while attending a contractors' convention in England. This year, O'Connor said, annual apprenticeship awards will be made at the district level only.

Matt Sherwood, director of the Western regional office, reviewed activities of that office and its staff during the past year. The various chapters reported on local activities and labor conditions.

Cornish gave his review of the progress of the research and education department of NECA (see District 5 report) and Paul Geary reviewed the financial outlook of NECA to begin the Saturday morning session. George Roscoe, director of public relations, covered the status of government regulations and advised members to keep acquainted with the rapid changes being made through the association publications and its newsletter.

Sylvania Electric Products presented its program for lighting maintenance which it titles "Qualified Lighting Contractor," illustrating how the contractor can set up to handle fluorescent lighting maintenance on a profitable basis. E. W. Gutelius, Robert W. Thunen and Henry J. Soubielle of Sylvania were present to explain details of the program.

The afternoon session Saturday was devoted to industry affairs. Fred H. St. Goar, regional price specialist of OPS, explained what the price regulations were attempting to do and described the organization of the OPS office to handle the problems at a local level. However, he was vague on how the general ceiling price regulation, which he admitted was a catchall, would apply to electrical construction. The problem that he could not answer was whether wage increases granted by the wage stabilization organization of the government could be passed on in increased prices to consumers. He did describe the method by which appliance prices can be adjusted on a margin basis. He predicted that there would be a more specific regulation on construction. He promised that let-

ters or telegrams for interpretation would receive answers within 48 hours. In answer to a question whether an established pricing service could continue to be used he said that if the contractor had been using it as his pricing method it would be considered acceptable.

Merrill F. Woodruff, industrial analyst, NPA, described the functioning of that administration whose targets are (1) To get the armed forces all they want when they want it (even though they waste so much of it), (2) share what is left and (3) expand American production to get all the materials needed. He advocated close association between the managers of the chapters and the NPA and assured that in most cases if the requests for adjustments were honest and reasonable they could be made. He warned however that violations would be checked over very thoroughly and the FBI would be turned loose on any suspected case, either of hoarding of materials or violation of the restrictions and orders.

While the CMP might be helpful, he was not too hopeful that it would solve all problems. No attempt is to be made to control the materials 100%. Despite the controls, he thought construction was going to be ahead of the previous year and said that the full impact of the restrictions would not be felt until July or August. He advised frugality in the use of materials and that no attempts be made to construct the forbidden kinds of construction. Military construction, he hoped, would offset business losses in other types but he observed that, after fighting a couple of wars in one generation, the American people were going to have to pay for it by pinching their standards of living.

Anaconda's program "Power Up and Be Prepared" was described by R. L. Hayward, district manager of the company in San Francisco. He told what various chapters in the region were doing to tie-in with this program, calling it an investment in the future business of contracting. He said it was a broad program, which would benefit all manufacturers, distributors and contractors by surveying and improving facilities for war production.

At the line constructors' meeting Gerald Petersen was re-elected its president, Charles Wikle vice-president and member of the board of governors, and Ed Wismer of Wismer & Becker, treasurer, replacing D. A. Solomon.

George Shetky, president of the Northwest Line Constructors, told of negotiations with the line locals in the Northwest on a telephone agreement. Underground construction is already in it. Problems of drivers of equipment were discussed and it was brought out that the shop steward problem had been solved by requiring that grievances be submitted in writing to a committee which reviews and passes upon them, with the Council on Industrial Relations as the final authority. George Seaman spoke of different types of agreements that are operating in various parts of the country. He advised that agreements be reached before it was necessary to hold Taft-Hartley elections, as the closed shop may be on the way out.

Otto Reiman, international representative, IBEW, was asked to talk to the group. He covered jurisdictional disputes between the line locals and ironworkers and millwrights. Ironworkers, the joint council had decided, would do the radio tower erection and heavy rigging, while the IBEW would do transmission line and power plant work. With the millwrights, the discussion is still going on, the IBEW wanting the heavy electrical work.

Two Bonneville Power Administration films, *Stringing and Sagging* and *High Line* were shown to the meeting.

Sacramento electrical wholesalers acted as hosts at a reception and cocktail hour Friday evening and the meeting ended with an informal dinner and dance prepared by the Sacramento Valley Chapter, whose arrangements were made by W. H. Welch, manager. The convention committee consisted of James Newmarch, Louis Stein, James Mapes and Rex Moore Jr.

Nevada IAEI's First

Inspectors hold state convention in Reno

For a first meeting the Nevada Chapter, International Assn. of Electrical Inspectors, staged its first annual meeting May 12 in a wholly professional manner. What's more, it had a total registration of 105 including wives, and just about every inspector in the state of Nevada. Even Mayor Francis Smith, after welcoming the convention, had good advice to offer the industry. Inspectors, he said, are often accused of lining up with unions or contractors to increase installation expenses; not with the public they are supposed to protect. He admonished the inspectors to live up to their responsibility to the public, not become restrictive, keep up to date in the use of new methods that may allow lower costs or better installation. The main job of the inspector, he said, is to protect the public against unsafe installation.

The meeting was presided over by M. E. Lundberg, chairman of the Chapter, Elko-Lamoille Power Co. I. J. Sandorf, Professor of Electrical Engineering at University of Nevada; Charles LeClare, electrical inspector for Reno; and Robert Osborne, Osborne & Dermody, were responsible for local arrangements and program.

A. L. "Dick" Pierce, Sierra Pacific Power Co., enunciated the utility attitude toward codes and ordinances. He said it was that the prime purpose of a code or ordinance be a standard of safety and that adequacy should be sold, not legislated. Pointing to the growth in kwh consumption in his own company, from 1,600 to 3,600 in a 10-year period, Pierce said the salesmen of the industry had done an exceptional job and would continue to sell more and more electrical benefit-bringing devices. Inspectors should go beyond policing and *advise* the public to install larger copper and better facilities.

John Patton, inspector for the Fire Prevention Bureau, showed exceptional knowledge of electrical safety requirements in a talk that followed. The fire inspector, he said, begins his duty when the job is finished and the wireman, contractor and manufacturer have turned the installation over to the customer. He urged that the industry do all it can to urge more outlets, better location of outlets for the appliances they are to serve, and education of the public especially on fuses —"that they are *supposed* to blow."

Labor's interest in codes was told by Harry Depaoli, president, Nevada State Federation of Labor. He deplored the lack of inspection in the rural areas where there is fire protection. The industrial commission, he said, has had inspectors in the field on industrial installations but home building needed the same protection. He also felt that codes were of no use if they were not enforced. Since the industrial accident inspection, he said, hazards had been eliminated to such

Ufer Staynor

LeClare Ash Doxey Lundberg

an extent that insurance rates have dropped measurably.

A very skillfully led code discussion followed. J. Hyde Staynor, Utah Power & Light Co., Salt Lake City, one of the "godfathers" of the new Nevada Chapter, handled the discussion period expertly and understandingly. Assisting him to answer questions were Loren T. Doxey, Elko city engineer and secretary of the chapter; William A. Ash, Las Vegas electrical inspector; Charles LeClare, Reno electrical inspector, and H. G. Ufer, western superintendent, Underwriters Laboratories Inc., another of the "godfathers" of the Chapter.

Ufer addressed the luncheon meeting in the Sky Room of the Mapes Hotel, attended by about 100 members of the electrical industry in the area. He spoke of the value of the electrical inspector to the industry and of the IAEI organization. Ufer encouraged all members to speak up in meeting regardless of self-consciousness. He assured all that other members would appreciate the problems they presented and assist them to find answers to them. He also described the procedure for getting official interpretations from the Chicago office.

Chairman Lundberg reported at the beginning of the afternoon session of the formation of the Chapter at a meeting in Elko June 23, 1950, and gave credit to the many men who had initiated it, such as Ufer and Staynor. Harry Linnecke, an electrical contractor of Reno, spoke of his 30 years in business when he had seen inspection come and go, even in Reno. He declared the meeting the biggest one of straight electrical men ever held in Nevada. "You can sure find the difference in the towns where there is inspection," he declared.

A brief talk on the national defense effort and its resulting shortages in materials was given by J. Walter Blair

Ash Earl Dodge Doxey Ufer

of National Production Administration. He introduced Ben Mathie as the local NPA official to whom questions should be referred. He also explained the CMP order which becomes effective in July. A significant statement was that the country's present status is about at the same point as it was in 1942 and that in the latter part of the year defense production would really begin to be felt.

Unprogrammed, Matt Sherwood, NECA Western regional director, spoke on the part of the electrical contractor in the industry and in code making. He told of NECA's efforts to get the inspector better recognition and higher pay and urged all the industry to help the inspector to sell the codes to the public.

Howard Dodge, senior engineer, Underwriters Laboratories, San Francisco, explained briefly the methods used by Underwriters Laboratories in testing of electrical materials and then emphasized the importance of checking materials against the Underwriters' list to see that they are used properly. He cited numerous examples where equipment tested and listed for one specific purpose is misused in another application. The lists are available to every inspector and contractor on request.

Available pamphlets to distribute to the public for simple instruction on the use of electrical cords and fusing were described by William A. Cyr, associate editor of ELECTRICAL WEST and a member of the public relations committee. Cyr also addressed the banquet in the evening, giving a humorous talk on "The Little Daisy—No Cost, No Wiring System." He was introduced by Frank Tracy, president of Sierra Pacific Power Co. and also of PCEA. A charter was presented to the Chapter by H. G. Ufer as secretary-treasurer of the Southwestern Section.

Officers elected for the next year were the same as those who have served since the inauguration of the chapter. They are M. E. Lundberg, Elko-Lamoille Power Co., Elko, chairman; Charles LeClare, Reno electrical inspector, first vice-president; William W. Ash, Las Vegas electrical inspector, second vice-president; L. T. Doxey Jr., Elko city engineer, secretary-treasurer; and an executive committee consisting of Prof. I. J. Sandorf, University of Nevada; Harry Linnecke, electrical contractor; J. Lyman Earl, electrical contractor, Boulder City, and Robert Osborne of Osborne & Dermody.

Las Vegas was selected as the next year's annual meeting place.

The Electric Industry is Prepared to Serve

PCEA reports on operation in a wartime economy

Tracy Sherwin

As the culmination of a year of progress, the annual convention of the Pacific Coast Electrical Association, held at the Biltmore, Los Angeles, May 21-23, was in keeping with the entire year of activity. Like the year itself, the program was packed with contributions to the electrical industry in thought and performance. Its theme, "Prepared to Serve," was followed into the administrative services, the business development and the operating economics phases of the industry by the committees and members interested in those phases of the business. The general program and luncheons brought inspiration and knowledge with which to meet the challenges of a defense economy. Warnings were heard calling for an awakening to the insidious infiltration of socialism, something this industry had to meet for many years before the remaining business community became aware of its own danger.

It was a big convention, overflowing the Biltmore to seat general sessions in the Philharmonic Auditorium; the Administrative Services Section in the Southern California Edison Co. auditorium. Although registration totaled 1,033, many more attended, an estimated 1,200 in all.

In the following pages a comprehensive report will be found of the entire proceedings, digested and abstracted or reported as to the most significant thoughts therein. Some of the talks have been condensed or abstracted, others described, still others will be found in full in other parts of this issue as feature articles. Some papers are being saved for future publication in more complete form.

At the annual business meeting that concluded the convention, Emory D. Sherwin, San Diego Gas & Electric Co., was elected president to succeed Frank A. Tracy, president of Sierra Pacific Power Co., Reno, whose year in office had brought so much progress to the PCEA. Tracy now goes on the board of directors. The directors up for re-election were all elected, and to replace vacancies from two who resigned two new directors were chosen. Sam Scott, Graybar Electric Co., Los Angeles, was elected to fill the place vacated by Harry L. Harper of the same company. I. W. Borda, The Okonite Co., San Francisco, a past president and past director, was selected to fill one-year unexpired term vacated by M. G. Sues, Sues, Young & Brown, Los Angeles. R. G. Holabird, National Electrical Products Co., San Francisco, was added to the board for a two-year term.

The board in a meeting at the convention selected L. A. Hicks, Hawaiian Electrical Co., Honolulu, as its vice-president for Hawaii; R. N. Dreiman, Coast Counties Gas & Electric Co., as vice-president for northern California; J. H. Pengilly, Square D Co., vice-president for southern California; Henry B. Sargent, Central Arizona Light & Power Co., Phoenix, vice-president for Arizona; F. A. Tracy, vice-president for Nevada.

Annual Report

In making his annual report of the managing director, Victor W. Hartley commented on the fluidity of the PCEA and its adaptability to changing conditions. Certain basic functions, he said, such as the code and ordinance and the adequate wiring promotion have been a continuing effort. But the guidance committees of the association have modified and adapted the section and committee programs and aims to meet the times.

Membership, Hartley announced, had reached an all-time high. Thirty new companies joined the PCEA this year, bringing a total company membership to 249. An additional 3,130 individual members makes the grand total 3,379. A new class of membership, life members, has been instituted and 138 such men, past 60, retired from active work and members of the association for more than 20 years, are now in that class.

"How Your PCEA Operates," a booklet prepared by the advertising and publicity committee, has recently been circulated, Hartley reminded. Another convention report is to be issued by the same committee, headed by F. M. Raymond.

During the past administration the first Hawaiian conference was held last Nov. 30. Another is scheduled for Dec. 1-2 this year and members were asked to participate. The fall conferences of the sections, too, were held separately last year for the first time, a plan that met with favor and resulted in larger attendance of each section's meetings. Carried out in this convention was the idea of concentrating all the convention's section meetings as three general section sessions in parallel rather than so many committee meetings in parallel that none were well attended.

Hartley reported on the code and ordinance and adequate wiring activities of PCEA, saying that 134 cities and counties have adopted the uniform code suggested by PCEA. A new 1951 edition to fit the 1951 National Electrical Code is in preparation. The committee is also working on discrepancies caused by the Los Angeles city ordinance on appliance sales and the California State Safety Orders.

Other PCEA activities reported were on the 4-H Club Electricity Project, the Electrical Living Institutes conducted by the home economics committee as well as the workshops for the girls themselves, the bulletins and the training manual prepared and distributed by the television committee.

The convention went on record praising the efforts and the results achieved in making the convention a success by the 1951 convention committees. Particular praise was given R. D. Moody, Allis-Chalmers Mfg. Co., Los Angeles, the general convention chairman. The committees, whose names were listed in the PCEA Pan-

Moody Adams Hawley

Lang Quinton O'Neil

F. A. Hartley

orama, ELECTRICAL WEST, April issue, p 98, all handled their responsibilities so ably that every detail of the convention went smoothly. Chairman D. D. Smalley, attendance; T. T. Kennedy, banquet; H. S. Warren, cocktail party; R. F. Gheen, golf; S. W. Scarfe, hotel; J. A. Long, ladies' entertainment; G. N. Hawley, program; G. R. Haysel, publicity; S. W. Scott, reception; C. C. Potts, registration; John H. Adams, stage manager; N. V. Arntzen, transportation; and Dean P. Cady, ushers, deserve particular commendation.

To Finance Expansion— Mobilize Investors

C. A. O'Neil

Partner, Duff and Phelps, Chicago

During the five years 1946-50 the electric utility industry as a whole raised nearly $5 billion from investors, and the California utilities upwards of $750 million. These sums increased by 38% and 73% respectively their total capitalization at the end of 1945. According to present plans it appears that both the industry as a whole and the California companies will need to raise at least as much in three years, 1951-53, as they did in the preceding five years. Thus it would be difficult to exaggerate the importance of mobilizing investors. . . .

It is axiomatic that considering investment capital throughout the country the amount available for the purchase of common stocks is limited. Therefore each industry must compete with all other industries for its share of this limited amount. The utility industry has done well in this competition and gives evidence of continuing to do well. But because the interindustry competition limits the amount available for utility common stock investment, the utility companies must compete among themselves for this limited amount. . . .

The investor has the whole country to chose from and his study consists of two phases. In the positive phase he considers each company separately in an effort to judge its position and prospects. In the second phase he makes comparisons of each issue in relation to all of the others. . . . The first step is to examine each company as to such important characteristics as business, territory, operating features, capital structure, comparative rates, earnings, management, public relations, regulation and the like. Of all these greatest weight is given to management, territory and regulation. . . .

With respect to territory, particular care is exercised in examining the recent and prospective rate of growth in population, wealth, industrial development and diversification, and related matters. Until about ten years ago it was generally held that the greater the prospect for growth, the better situated was the utility. The last ten years have forced a revision of that concept. Now it is recognized that, from the investor's viewpoint, there is an optimum rate of growth and that beyond that rate, excessive growth may be detrimental to stockholders. . . .

Just a few figures will demonstrate that fact. Comparing 1940 and 1950 we find that kwh sales increased about 140% in California as against 105% for the rest of the country. Generating capacity increased nearly 125% here as compared with 75% in all other states combined. Customers increased 60% within and 40% without the state. Capitalization has increased over 70% for the California companies and under 40% for the electric utility industry as a whole.

Has this excessive growth been unfavorable to investors? According to the annual report of the California PUC, rates of return earned by electric utilities of that state on a depreciated rate base went down from 6.80% in 1940 to 5.18% in 1949. . . .

For the four principal California electric and combination gas and electric utilities and ten comparable companies outside the state rates of return computed at quarterly intervals for 1948, 1949 and 1950 declined from 5.2% for the California companies in the first quarter of 1948 to 4.8% for the fourth quarter of 1950. For the out-of-state utilities the range downward was from 6.8% to 6.2%. . . .

From the investor's viewpoint the ultimate expression of earning power on common stocks comes from their dividend paying ability. . . . How do California companies stand in this important phase of competition for investment capital? The four California companies are now paying 10% more than their 1946 dividends, but the ten out-of-state companies pay 36%. That, of course, isn't the whole story. Investors give weight to continuity of dividends, and in this respect the California companies stand high. . . . California utilities, by their record, had attained a high standing among investors long before the present era of very great growth. That is why they have been able to attract the enormous amounts of new capital in competition with other utilities.

If, however, that competitive position has slipped, then what are the corrective steps that should be taken? . . . The investor's answer would be plain: raise the rate of return and consequently the earning power per share, and increase dividends correspondingly. . . . Between 1940 and 1950 California utilities accomplished the almost impossible by reducing average residential rates by 21% while other costs have gone up nearly 84%. Moreover this was accomplished in the face of obstacles. But there is evidence that the burden may have gotten too heavy for your best efforts, unassisted. In those circumstances there would be no recourse except rate relief. In the face of the record, there is nothing shameful about increasing rates. Customers' pocketbooks are affected intimately and to a substantial degree by varia-

Smalley Evans

Penn Sherwood

Jones Borda

tions in the state's level of economy. Insufficient electric supply would unquestionably limit growth in the state's economy. . . .

To firm up the present electric supply and to increase it to meet the expected new demand, large amounts of new capital are required. Your position in the competition for the limited amount of capital available for investment in common stocks is the determinant of your ability to protect and expand electric supply which is vital to the economic welfare of your service areas. Does it not follow, then, that your customers' over-all interests far outweigh the small added out-of-pocket cost of a rate increase sufficient to restore earnings to an adequate level under conditions predictable during the next several years?

Ours Is No Job for Amateurs

Chester H. Lang

Vice-president, General Electric Co.
Schenectady

Through its long and glorious history, some 70 years of war and peace, depression and prosperity, Square Deal, New Deal, Fair Deal and Misdeal—the utility industry has never to my knowledge let America down when it needed power. Today demand is running one billion kwh ahead of last year, and the demand is being supplied with capacity to spare.

Yet what do we hear from people who might reasonably be expected to know better? Some of our best business papers, apparently none too careful about sources, are printing little items about "the impending scarcity of power," as it is phrased. There are hints that the private interests are going to hold back in providing America with the power she needs. Now this phoney contention can and has been refuted with facts and figures. . . .

There is always a temptation for the amateurs "to get into the act." One would think that they might be just slightly nervous, if not downright scared at the complexities involved in expanding the nation's electrical system. But no, in spite of our 70-year record, we are told that we don't understand our business; that such an important matter as electricity is not to be left under the direction of the people who make a living at it.

It's not as if we didn't know what would happen if these "volunteers" get into the driver's seat. They've made it elsewhere — notably in England. And it might be instructive to see what they've done with a certain important part of the British economy, namely, the electrical industry. Here are some quotations from the Dec. 9, 1950, issue of *The Economist*, a highly authoritative English journal. The article is rather cheerfully titled "British Electricity Horizons." As far as I can see there is no horizon in this picture. . . . Lord Citrine, chairman of the British Electricity Authority, says the power supply situation "is not only serious, but may be dangerous or even disastrous." Meanwhile, in only two years, the nationalized industry has managed to push the price of electricity up higher than it has been in more than 15 years.

Why did the prices go up? Not because of technical incompetence. In fact they managed to trim back the cost of power generation a little bit. But here's what *The Economist* said: "The rise in administrative costs completely absorbed the authority's successful efforts to shave a little off station costs." Notice that there is no mention of tax costs. That's because "as in 1948-49, BEA has paid no income tax or profits tax.". . .

The editors of the magazine urge that BEA make a really "forceful attempt to apply disincentives to the consumption of electricity at peak periods." "Disincentives!" There is a piece of word-magic worthy of the race that produced Shakespeare! Disincentives indeed! I think that word sums up what would happen if the electrical industry ever failed in its courage, and hence surrendered its freedom. . . .

In the mobilization program billions in military output will be piled on top of a whopping big civilian output. If the Wilson plan works, civilian output is expected to continue at its all-time high levels of around $265 billion (in 1950 prices). All of the billions of defense money will be extra, feeding the flames of inflation and straining our industrial machine and resources to the limit. It can bring us security and lasting strength—but it can also bring us galloping inflation and chaos if we lose our balance.

As you know there are already termites at work in the structure. The greedy ones, placing self before country.

The lazy ones, willing to ride along with the boom and taking no thought for the morrow.

The timid ones, who say it can't be done.

The hysterical ones, who want to hurl us into war regardless of the consequences.

The wasteful ones, who use the emergency as an excuse for throwing money away.

The stingy ones, who can't see that weakness costs more than strength.

The opportunists, who will use the crisis to foist all kinds of bug-brained projects on the taxpayers . . . These and many others could easily scuttle the whole mobilization program.

Certainly the businessman has a large responsibility in this kind of a program. It's up to him not only to produce the necessary arms, but also to keep the American economy in balance and in motion. In this light may I suggest three fundamental responsibilities that fall especially upon all members of the electrical industry.

First, there is the responsibility to supply all the equipment and power that America needs to do the job. . . .

Voorhies Vic Hartley

Coke Fagerskog

A second responsibility that might come hard in this era is this: Keep on selling . . . The men who sell power and equipment to industry have special responsibilities in the crusade against communism. For they are selling the ways to productivity. It's their job to get America in fighting trim for whatever comes. . . .

The final responsibility is to speak up for the way of freedom, truth and common sense. For many reasons the men in the electrical industry are qualified to supply the leadership that America so desperately needs. . . . Let us speak up in the industry's long tradition of leadership. For as the Apostle Paul said, in that brave letter to the Corinthians: "If the trumpet give us an uncertain sound, who shall prepare himself to the battle?"

T-H Law is Not Strong Enough

Fred A. Hartley Jr.

Former Congressman and Co-author of the Taft-Hartley Act

There has been some question as to whether or not the Taft-Hartley law will remain on the books or whether or not it would be killed by indirection. Well, let me say this: In spite of the fact that the President has failed to enforce the law since the 1948 elections, in spite of the fact that the National Labor Relations Board is doing its best to make it unworkable, and in spite of the fact that the man who has done most to enforce the law —and I'm speaking of Bob Denham (former Labor Board chief counsel) —was fired for trying to enforce the laws of the nation, I can tell you that if the Taft-Hartley Law is to be changed, it will be changed by its friends, not its enemies.

I would like to make it perfectly clear that I don't speak as a partisan as I say that. I would like to point out to you that, although the act bears the name of Senator Taft and myself, it was by no means a partisan piece of legislation. I would like to point out something that isn't generally known or understood: the Taft-Hartley bill received an overwhelming vote of the majority of both political parties, and the vote, in the House of Representatives, making it the law of the land, was the largest vote in the history of the nation ever to override a presidential veto.

It has been called a slave labor law, but I would like to point out two provisions of the law—and to my mind they are the two most important provisions—and to my mind these are not strong enough.

The first is that provision to prevent mass picketing and the use of violence in the conduct of a strike. I'd like to make it perfectly clear that I'm not thinking in terms of big business vs. big labor. But in Detroit I saw big goon-squads, called in from Pittsburgh New York and Chicago—as well as Detroit—going around from gas station to gas station, not only beating up workers who went back to work in spite of the strike, but also beating up private citizens who had the timerity to buy a few gallons of gasoline.

You may say to me, "What does the Taft-Hartley Law do in such a situation?" This law provides that the worker—if he is on the way to his job and has his nose broken and his eyes blackened by the strong-arm boys—can go into court and get a cease and desist order: "don't do it again." In my opinion that law is not only inadequate, but it comes too late.

You may say to me, that if you don't think the law which you helped to write is not strong enough, what would you do about it?

First, I would provide in the law a definition of just what is "peaceful picketing."

Secondly, I would also define in the law and require that only those who were actually employed in the place that's being picketed be allowed to picket. If that doesn't do the job, I would give every worker who has been threatened by mob action, the right to sue for the wages he lost as a result of that mob action.

I've been told that this is interfering with the worker's right to strike. I can see and appreciate the worker's fundamental right to strike, but what I want to do is to protect an equally fundamental right—the right of every worker to work, the right to go to that job free from harm or the threat of any harm to him or his family.

In other words, I want to see law and order returned to these United States—yes, even in the conduct of an industrial dispute. In my judgment we're going to have to come to that sooner or later.

The other provision in the Taft-Hartley Act is that one dealing with nation-wide strikes. I'm referring to the kind of strikes that John L. Lewis can call. Here is a great labor leader who can not only shut down the coal mines, but every other industry in the nation that depends upon coal.

What do we do under the Taft-Hartley law? Remember now, we're talking in terms of a strike that threatens your safety, your health, and—yes—in these times, your very security. What do we do under the Taft-Hartley law? We provide that when the President finds such a situation prevailing—which he hasn't found since 1948—he can appoint a board of inquiry that is required to report to him in 15 days. At the end of those 15 days he is authorized to have the Attorney General get an injunction from the courts—that injunction lasting some 60 days. The negotiators of both labor and management are supposed to reach some agreement within that time. Then the individual employees vote on their employer's last offer.

If they decline to accept, there is nothing in the Taft-Hartley Law or any other law that will allow the President of the United States to deal with so serious a strike condition. In my judgment, that provision is not as adequate as it should be.

I would do what we wanted to do in the House in the first place. I would apply the Sherman and Clayton antitrust laws to a labor monopoly in restraint of trade just as we apply it to a business monopoly, particularly when that restraint of trade is against the nation's public health and safety.

And if anybody can point out to me any business monopoly in all history that can exercise the controls over economy such as do John L. or Mr. Tobin or Mr. Murray or many

others I could name, I defy you to do so.

(At this point Mr. Hartley launched himself into a series of serious and non-serious stories—which he said were all factual—pointing out the government's constant bungling and abusing of its use of controls during World War II. These examples were based on his investigations while a member of the House of Representatives. The butt of most of his examples was the Office of Price Administration.)

I make these observations because already I see some of the same line of thinking, emanating from the OPS as I observed as a member of an investigating committe when we were looking into OPA. As an example, the attempt that is being made, not only by Mr. DiSalle, but even with the concurrence of Mr. Eric Johnston, to use the pricing machinery of the nation not merely to control prices, but also to control profits as such. I have examined some of these key pricing officials and some of them admitted that they believed in the economic philosophy of "production for use and not for profit"—and if that isn't Commie thinking, I don't know what is. The free enterprise system itself is at stake.

In this land of ours there is nothing about a congressman, there is nothing about a senator, yes, there is nothing about a president, that an election won't cure.

How the Manufacturers Are Facing up to Mobilization

Walter Evans

Vice-president, Westinghouse Electric Corp.
New York

In the past five years of Soviet saber rattling, industry has poured $115 billion into new and improved plants. The results have been more employment, greater production and sound national progress. New industrial sinews are made up of $5 billion worth of new motive power and rolling stock for the railroads and an $8 billion oil expansion program, which has increased refining capacity 25%. In contrast to Russian steel production of 30 million tons annually, our current production exceeds 100 million tons and it will soon be increased another 14 million tons. When this expansion is effected, the U. S. will produce more than half the world's steel supply. We are familiar with the tremendous expansion in the electrical industry—an increase of 40% in electric power capacity, with 35% more expansion planned for the next three years. Proportionate increases are indicated in almost every industry.

Production Advantages

It certainly is paradoxical that a system that has given the U. S. a material standard of living which those in other countries could hardly dream of and probably never will attain, should be under attack from those people as well as from citizens of this country. Maybe we can best sum up the advantages production gives this nation by pointing out that our potential war production is greater than all the rest of the world, vastly greater than our own volume at the peak of the last war. It is no understatement to say that American productive capacity is the most powerful political and military force in the world today.

In our own field, the manufacture of electrical goods, the three major suppliers of such equipment have spent nearly $750 million in enlarging and improving facilities during the past five years. Of the 200 plants now operated by these companies, 85 have been put in operation since 1940. The significance of this expansion is revealed in the annual reports of these companies for 1940 and 1950. In 1940 combined sales were $813 million. By 1950 total sales were $3,324 million, an increase of more than 300%. If we discount higher price levels, production measured in terms of physical units has increased in a ratio of about two and one-half to one. . . .

Company-wide our military commitments represent about 35% of our production, and we believe this figure is applicable to the electrical manufacturing industry as a whole. The remaining 65% is a lot of capacity, and a good proportion of it will be devoted to providing the equipment for electric power so fundamental to all industry. At the end of the first quarter of this year, our industry had orders for 26 million kw of generating capacity. The three major manufacturers previously referred to had a capacity of 3.5 million kw before the war. Scheduled production is nearly 9 million kw for 1951 and 12 million kw for 1952. By that time there will be sufficient capacity to build 47 million kva in power transformers each year, with similar increases in capacity for switchgear, condensers and motors.

On the unfavorable side, the two most pressing problems are materials and manpower. Each of these are encompassing and complicated subjects. Copper, chromium, aluminum, nickel, cobalt, steel (electrical manufacturers are the sixth largest consumers of steel), chemicals, resins, asbestos cloth, rubber gaskets—all these and many others—are vital in our manufacturing processes and all are in short supply. . . .

Despite these disadvantages of manpower and materials, and fully realizing that there are conditions beyond our control, this year we will equal or exceed our last year's production of the power and associated equipment needed by the utilities.

Our military commitments and the equipment to be built for the utilities is a good part of what the electrical manufacturer will be doing in the mobilization program. Meanwhile we will continue to manufacture the many other products that make up our loading. Consumer goods will probably be 20 to 25% below the record 1951 figures, but at that, production should equal that of 1949, the third largest production year in history.

Why and How Materials are Controlled

C. W. Jones

Consultant, DEPA
Washington, D.C.

Responsibility of the Defense Electric Power Administration was summed up by Chandler W. Jones, consultant DEPA, who came out from Washington for the meeting. "Less than six months ago," he said, "in the early days of the defense emergency, the electric power program as then planned, called for an expansion of the nation's electric generating capability by 21,000,000 kw within the period 1951 through 1953. Already that estimate has been outmoded by fast-moving events and mounting needs. In DEPA we are now talking in terms of a 27,000,000-kw expansion in these three years. We believe that this is the increase the industry must achieve if it is to do the electric job assigned to it in the over-all preparedness program."

He continued, "our job in DEPA is to analyze the power needs of the country to make sure those needs will be cared for by an adequate power program; to implement the program with the necessary materials; and to provide incentives where needed." Concerning industry's part, he said, "during the next couple of years, while we are building up our military

strength, we shall be diverting materials, converting plants, and disrupting normal life for business and consumers. It will not be as drastic a shake-up as if we were in a global war, but whatever the situation calls for must be done. Our continued existence as a nation may depend on how well we carry out this program.

"We are expected to provide planning and programming and to assist you in obtaining essential materials and equipment," said Jones. "While much of our work is in the planning stages, we believe we have made substantial progress by establishing orderly process of learning your requirements and filling your needs. Our constant effort must be to keep things moving and see that both construction and equipment schedules are maintained. DEPA is in the picture as advisor and helper, but the actual work will be done by the electric utilities themselves."

Electrical Contractor Under Mobilization

Matt J. Sherwood

Field Director, Western Region
National Electrical Contractors Assn.

The electrical contractor today is a prime example of the free enterprise system. As an independent small business man, he is vitally engaged in a keenly competitive economic system.

As a leading example of free enterprise, he expects and is entitled to your cooperation in keeping him established as an independent, small business man. He is as vitally interested in your business as you are in his.

In his capacity as an entrepreneur, he is required to fulfill the following qualifications: (1) Maintain intact an integrated team of management, supervisory and skilled personnel because of constant use. (2) Provide proper supervision. (3) Furnish qualified construction engineering service. (4) Coordinate his work with all other crafts. (5) Special tools. (6) Special equipment. (7) Capital investment. (8) Labor relations—maintain regular daily contact with manpower. Settle grievances quickly.

Since the electrical contractor's interest is restricted to one specialized branch of construction he has more varied and detailed experience.

His key management personnel has the know-how born of years of experience.

The knowledge of new techniques, tools and materials comes from intimate day-by-day association with the electrical business.

The incentive to apply this know-how and knowledge to best advantage comes from his complete dependence on the success of his business for his livelihood and for the protection of his investment.

The National Electrical Contractors Assn., an association of 3,000 members, in 94 chapters, 50 years established, represents the electrical contractors and serves them to aid in their part of the mobilization program. Some of the services offered to them are as follows:

Field service. I am part of that staff, and so is Mr. Harder, whom many of you have met. The chapters themselves are autonomous in their operation but the services of the field staff and the NECA programs are made available to them. These programs cover, as an integrated service, the education and research data prepared by NECA through its members; public relations and information, through NECA publications—*Qualified Contractor* and a weekly newsletter and other bulletins; contact with the governmental agencies in Washington; assistance in labor relations at the national level; an apprenticeship program worked jointly with the IBEW at both the national and local levels to train more electricians.

These services help to train the contractor to be a better partner in the industry, to become a better Qualified Contractor.

Through the NECA the contractor takes his part in the interdependence program of the entire industry. He has representation on the National Electrical Code through the NEC representative on that code. He has available to his business a guarantee program, business promotion kits, business and accounting systems, management counsel, etc.

But all of these programs have to be worked out at the local or chapter level, and we have here in Los Angeles the largest chapter in the association.

(Sherwood then called upon Warren Penn, executive vice-president of the Southern California Chapter, who spoke on the interdependence and interrelation of the electrical contractors with the other branches of the industry and of some of the national problems all business faces to maintain and retain the private enterprise system in the face of growing government restrictions.)

Organization Will Pay Off for Management

Darrell H. Voorhies

Assistant Manager, Department of Organization
Standard Oil Co. of California
San Francisco

A business with as few as 100 employees can reap rich dividends from a man who devotes himself to the functions of organization, Darrell H. Voorhies, assistant manager, department of organization, Standard Oil Co. of California, told the general session Wednesday morning. For proof he cited the experience of Standard Oil with a 22-man group specializing on the responsibilities of planning, methods and research.

Sooner or later, Voorhies said, every supervisor becomes involved in finance, personnel and organization through impact on pay roll, facilities, personnel training and getting the most effective effort out of people under him. From the standpoint of both employer and employee, effort must be effective, he said. Similarly through concerted effort, more things can be done than by individuals. Differentiation of effort, he reported, is what makes possible specialization, and this, in turn, is the basis for industrial engineering. One of the functions of the industrial engineer is to provide suitable job definitions and to define responsibilities that go with different jobs.

Voorhies emphasized that the delegation of responsibility and authority for the performance of the most effective work can best be done by those charged with personal supervision. As a general policy this delegation usually follows the primary functions of a particular business through such things as geography or the type of product or service may have a bearing on the ultimate alignment. In the case of Standard Oil, he reported, the delegation follows functional lines—exploration, production, manufacturing, transportation, marketing and finance.

In any business there are pressure groups, which provide management with a series of checks and balances, he said. Pressure might be exerted by the public, by employees or stockholders or vendors or lienholders—all of which stem from the public. He cautioned that an aroused public will quickly bring a change in management, and by the same token, the public will respect and esteem a company that performs as a good citizen should. Each segment, he said, has diverse interests. For instance custom-

ers are interested in quality, price and service; employees in opportunity, training, wages and salaries and benefits. If the customers want a lower price and the employees higher wages, there is an immediate incompatibility of interests. Similarly the interest of stockholder in greater earnings and higher dividends might not be compatible with those of either employee or customer.

It is the job of management to reconcile these diverse interests, Voorhies declared, through planning, coordination and control. The control functions are principally administered by staff, he said, with the organization department charged with planning the architectural pattern or basic design; setting up the controls for manpower, methods and procedures; defining jobs and determining the appropriate price for each, and finally with conducting research on organizational techniques.

He defined both the need and the advantages of an organization department and gave a detailed analysis of procedures. The needs, he reported, are to show divisions of work, combination of functions, objectives and purposes, delegations of responsibility; to control the pattern and size of the organization, the span of control; and to provide specialization. An organization department will permit management to know the objectives and purposes of divisions and departments in a company, to know the lines of authority, to eliminate overlapping, to improve cooperation, to reduce frustration and to differentiate between line and staff.

New 4-H Farm and Home Electric Program

J. Earl Coke

Director of Agricultural Extension, University of California
Berkeley

Of all the many services rendered to rural people by the Agricultural Extension Service of the University of California, 4-H Club work is the most far-reaching and permanent. Here the results of our labors are not primarily better stock, larger crops and better managed homes. The results are young people equipped with knowledge, attitudes and skills that fit them for a place in society. . . .

California's 4-H Farm and Home electric program, now sponsored by the PCEA, is an excellent example of cooperation with business and industry. Through the resources of your association, attractive literature has been prepared, 15 power company employees trained as instructors and incentives have been provided for club members.

This has resulted in the enrollment of 2,300 boys and girls in 47 counties with 277 volunteer leaders consisting of farmers, electricians, mechanics and just plain "Dads.". . . No 4-H Club project in our California experience had had such a quick acceptance nor made such a rapid growth as this new electric project. The reasons are not hard to find. First of all electric power is available on practically every farm in the state. The subject, electricity, proved to be fascinating to both boys and girls alike. Then colorful and well-planned literature caught and held their interest. In addition, provision for leader training schools provided a plentiful supply of volunteer leaders and, finally, incentives sparked the interest. . . .

4-H Club work involves boys and girls 10 to 21 years of age. The objective of the work is to develop competent young people, proficient in the skills and responsibilities of the home and the farm, and versed in the democratic methods and philosophy of group action. Membership is open to all boys and girls in town or country. Present enrollment in California is 25,000 and the state potential is approximately 100,000. . . .

4-H Club work is a combination of the practical and the idealistic—practical in the sense that club members actually live and practice the things they learn; idealistic in that the program is clothed with certain ideals of performance. These ideals are interpreted by the 4-H Club pledge in which the club member pledges his Head to clearer thinking, his Heart to greater loyalty, his Hands to larger service and his Health to better living for his club, his community and his country.

Quinton Dreiman Wright Stoner

What 4-H Club Work Means to Youth

Young farmer tells how he benefited from farm electric program

With assurance and poise commendable to one twice his age, James F. Fagerskog, 17-year-old high school senior from Sacramento, winner of one of six Westinghouse Educational Foundation scholarships, reported on the benefits he had derived from 4-H Club farm electric work.

Through active participation in the program he has gained a working knowledge of electrical safety, heating, power and illumination, he declared. This knowledge has been translated into a safety skit at a farm meeting, into the construction of an electric pig brooder, which paid off by saving the life of a pure-bred hog, and into the construction of both an electric honey extractor and an electric lawn mower.

Fagerskog said of even greater benefit to him had been the personal contacts he had been able to make with people from all over the world at the national 4-H Club conference. Through these associations he had gained knowledge of life itself.

Administrative Services

E. J. Wright, chairman
Dexter Stoner, vice-chairman

Administrative problems in a war economy were detailed by speakers at a section symposium Monday and Tuesday afternoons in the Edison Bldg. auditorium. Ten joint meetings with the American Gas Assn. during the year had uncovered many operat-

Shaw Wylie Tubbs

Heinze Moore Garber

ing difficulties, Chairman E. J. Wright reported, and had paved the way for this general assembly meeting. Wright presided the first day, Stoner, next year's section chairman, the second.

"In the criticial period ahead, let us be sure that no area of decision passes to government because of any failure on our part to accept responsibility, to make judgments and to act wherever we have the freedom to act," Harold Quinton, So. Calif. Ed. executive vice-president, urged in opening the symposium. Every one of the frequently recurring crises has been used to goad unthinking people into abandoning more and more of their freedom, he pointed out, adding that business managers, being human, are also susceptible to the conditioning process of submission to long-continued domination.

Factors that administrators in the electric contractor, supplier and utility field can expect to find in the indefinite period ahead, according to Quinton, are: more inflation; attempted expansion of the government's power program; controls over credit, prices, wages, materials and production; manpower difficulties.

Although inflation erodes the accumulated capital of *all* industries, its effects are perhaps more apparent in regulated industry, he believes. Electric utility rate of return and charges are related to original cost (replacement costs average almost 100% higher) and it is impossible to replace from earnings the capital being consumed in operations. Quinton advised, therefore, that, while we must continue to meet the demands of defense mobilization, it is incumbent upon us to avoid needless and wasteful construction programs.

President Truman's 1952 budget contains requests for almost $1 billion for the government's electric power program; if past record has been followed, these facilities will cost nearer $2 billion, Quinton believes. This attempt to push the government power program onto the country in the name of national defense is not a problem solely for the electric utilities, he warned. "Consider, if you will, the position suppliers and contractors would be in if the government should become the sole buyer of electric facilities and equipment."

Since political rather than economic considerations direct most government interferences with our economy, no realistic forecast can be made of the scope and nature of controls, he thinks. Plans must be kept flexible, both operation- and capital-wise, he urged.

Despite his promise last year that he would not use defense powers to advance public at the expense of private power development, Interior Secretary Chapman has decided to free REA requests for scarce materials from the red tape required of private companies, Quinton pointed out. He also charged Secretary Chapman with responsibility for the fact that, although hundreds of millions of dollars have been certified to a dozen or more industries for accelerated amortization of war facilities, up to the middle of May not one dollar had been certified for electric utilities.

Prompt and realistic training and recruitment programs may alleviate some of the difficulties brought by conscription of personnel but a greater threat to our country's security lies in another direction, he said. This is the maneuvering of union labor leaders to procure for themselves greater power over the economy. Both the National Advisory Board on Mobilization Policy and the new Wage Stabilization Board will stimulate the growth of socialist-labor government in America, he believes. As the crisis deepens, we can expect the demands of labor bosses to come forth in the guise of government directives, he stated.

Although we can expect the responsibilities of management to multiply while freedom to meet them is being drained away, we must stand ready to make decisions in the area of responsibility left to us, he urged. We must be alert to our duties until the final source of control—the American consumers—calls a halt to the campaign of those who would control them.

Purchasing and Stores

S. R. Robinson, sponsor

Speaking on purchasing and priorities in a wartime economy, Paul Griffith, So. Calif. Ed., pointed out that utilities have DO-97 for M. R. O. and minor plant; DO-48 for copper and aluminum and, so far, for steel on major jobs; have filed on major power equipment that should come through on schedule without any rating; have procedure to get spot priority where needed.

He pointed to a myriad of other items, however, for which suppliers are beginning to ask for DO ratings. The answer to this problem is the Controlled Material Plan, which contemplates allocation of available critical materials to all industry based on stated requirements, with defense and defense-supporting industries getting first call.

Although these regulations and restrictions probably will slow down utility construction later on, and purchasing and stores departments will have a job keeping delivery schedules up to date, priority problems at present seem fairly simple compared to those of World War II, Griffith thinks.

Tackling the problem from the standpoint of the stores department, A. A. Charonnat, PG and E, listed factors peculiar to utilities:

1. Reports required by government agencies are not readily prepared from utility records. For example, inventory of copper and copper alloy must be expressed in net pounds of copper content, while utilities generally carry them under units of pounds

Liecty Kiser Walbridge

Robinson Charonnat Griffith

or total footage of conductors.

2. Extended deliveries make it necessary to project orders for regular material far into the future.

3. Line hardware and similar items have generally met the scheduled deliveries but poles, cross arms and conductors have not, resulting in excess inventories of the former.

4. Inventory limitations necessitate careful scrutiny of sizes of such items as conductors. Salvage materials also may distort inventory.

5. Bombing danger requires shifting material from critical to remote areas, with careful packaging and marking.

6. Manufacturers do not adhere to packaging standards for certain articles.

The situation can be helped, Charonnat believes, if jobbers and manufacturers notify utilities immediately when they cannot meet scheduled deliveries. Stores should review stock with the operating department to see where substitutions can be made. Opportunities for disposing of inactive or excessive items are greater than under normal conditions.

Transportation

H. B. Wylie, sponsor

In discussing operation and maintenance of automotive equipment, S. B. Shaw, PG and E, dealt with general, rather than disaster, conditions.

Factors contributing to reducing need for repairs and maintaining continuity of operation are: (1) careful and skillful operation of equipment; (2) careful selection and training of operators; (3) moderate speeds; (4) preventive maintenance, including regular inspection and adjustment; (5) engineered maintenance, including study of recurring types of failure or abnormal wear with view to design modification; (6) conservation by salvage and reclamation; (7) conservation of manpower by rearrangement of procedures; (8) attention to new developments in methods and tools.

As vehicle production is curtailed, activities will be curtailed in certain areas and industries, making available used equipment. This used equipment may become an important factor in maintaining service, Shaw believes.

Opposition to extravagance and diversion of motor vehicle taxes, as well as support of uniform state laws on gross weights, width, height, safety regulations and inspections were advised by M. D. Tubbs, So. Calif. Ed., who spoke on legislation affecting transportation. Constant vigilance and a good deal of hard work outside business hours were suggested in dealing with these matters.

In the Los Angeles area, much is being accomplished by the Automotive Council, Tubbs reported. This non-profit organization is financed by proceeds from an annual Truck, Trailer and Equipment show; has active and associate members. Proposed state laws affecting automotive transportation are summarized and discussed, then either supported or opposed by the group.

Among proposed bills soon to go to Congress are one to provide an increase in the manufacturers' excise tax and one for an additional 1½c federal tax on gasoline. At the state level, a ton mile tax, gross weight tax and additional gasoline tax are being proposed.

Right of Way and Land

H. L. Moore, sponsor

Four courses will help solve the manpower shortage in right of way and land departments, according to R. K. Heinze, So. Calif. Ed. They are: (1) In-service training of unskilled workers already on the pay roll. Training should not be so rapid that it absorbs too much skilled employee time or is not thorough. (2) Use of over-age or retired potential. This source yields wealth of experience but less productivity; may be used effectively for in-service training. (3) Employment of women. They can handle conveyance and escrow work and certain phases of field work, such as appraising, soliciting and leasing. (4) Development of broader job analysis to adapt operations to a different sized or less skilled work force.

Field time can be conserved by intelligent use of telephone and mail, Heinze reminded the group. Better planning and scheduling also can be of maximum benefit, he said.

To many property owners, the right of way department *is* the company, W. F. Garber, San Diego G&E, pointed out, and no department of a public utility is so conscious of public reaction.

A situation facing right of way men daily and one that often produces customer dissatisfaction is that of easements and overhead distribution in subdivisions. Listing some of the headaches in this connection, Garber stated that the remedy is education of all concerned in planning and developing a subdivision.

The most elementary factors, taken into consideration automatically by right of way men are strange to engineers untrained in laying out distribution systems, he said. Simple facts—that angle and end poles must be anchored, that certain ground clearances must be maintained by conductors, that service drops cannot exceed certain lengths, that 60-ft trees sometimes create a deterrent between 40-ft poles—never enter their calculations.

A developer's major concern is to get as many lots out of a given area as possible, Garber explained. Location of underground utilities is taken care of; for overhead facilities he dedicates, or thinks he dedicates, an easement adjacent to the rear line of such lots as he deems advisable. Location of easements is planned on a

DeGroot Noia Hansen

drafting, or ouija, board and it matters not that the rear lot line may be in a canyon 100 ft below the buildable area of the lot!

Garber believes that not until companies can prevail upon all concerned to give as much consideration to planning overhead utility service as to other necessities, will street alignments, lot spacing and easement locations be adequate.

Administrative Problems

Administrative problems are many; they are quite confusing; few companies have adequate administrative personnel to handle them; no matter how hard that personnel works, the number of problems remaining unsolved seems to grow and grow and grow. That is the picture as R. N. Dreiman, vice-president and treasurer of Coast Counties G&E, sees it. However, he has confidence in the industry's ability to find ultimate solution.

All administrative problems do not arise from directives and regulations, he said. Those arising from increased demands for service and labor and material shortages originate from the "war" effort itself. Meeting increased costs is directly traceable to inflation.

Most companies are attempting to handle the administrative burden with the same personnel that previously had been kept busy handling the normal peacetime load, he pointed out.

Specific difficulties confronting management today include:

1. Preservation of vital records, which substantiate costs upon which rate base is predicated. During World War II, fire and water did more damage than bombing itself to records. Dampness, mold, loss during dispersal, seizure by the enemy are other hazards. Many organizations are microfilming essential records and sending the film to distant points.

2. Practically everything utilities buy has almost doubled in cost but their rates are less than in 1940. Unprecedented number of rate increase applications before the PUC has prevented prompt relief. In a recent gas rate case, 10 witnesses were presented and 35 exhibits (100 copies of each required 100,000 sheets of paper) were filed. Under present procedure, it takes just about as many exhibits for a small utility to present its case as for a large one.

3. As a result of large capital expenditures, most California utilities have doubled their capitalization in the 5½ years since the war ended. This required additional work in preparation of prospectuses, registration statements with SEC, applications to regulatory commissions, negotiations for sale of securities.

4. Plant security demands (a) consideration of all practicable, essential security measures; (b) a common understanding of security problems; (c) a common interpretation and application of adopted measures to the extent necessary. Usually this is assigned to a committee.

5. Recent orders governing materials were not drafted specifically for public utilities and are hard to interpret. Nevertheless the limitations they impose will retard construction work and advance planning will be necessary to minimize delays. These regulations require extra paper work and bookkeeping, but the real problem will arise should present accounting department machine equipment prove inadequate to handle the extra burdens superimposed on the present work load.

6. Wage stabilization means study, analysis and interpretation of the general regulations. Those released so far are complex and contain many record-keeping and reporting requirements.

7. Detailed studies of manpower requirements are necessary to adequate planning for any prolonged shortage.

Decentralization of authority is one way to meet the greatly increased administrative burden, according to Dreiman. By leaving as much of the task of decision making as near the action level as possible, self-sufficiency of geographically dispersed units is increased; task of decision making is spread resulting in quicker action; top level executives are not burdened with minor decisions; lower levels are trained for broader responsibilities.

Work simplification programs have been planned by several of the companies represented, Dreiman stated. Ample room has been found for outside specialists and internal staff in this planning, he said, but where the outside specialist is used, it is desirable to have the detailed studies and follow through done by the internal staff.

Accounting

J. L. Liecty

More to do and less to do it with is the two-pronged dilemma in the accounting department, according to J. L. Liecty, Central Arizona L&P. "Accounting 1951 style," he suggested, "is a matter of making better partners out of all levels of supervision by building up their vision and allowing them to bring sound thinking to bear on the terrific problems ahead. It's a matter of getting a meat cleaver after nonessentials. It's a matter of breaking down jobs to fit the talents and skills we are able to employ. If we attend to this, the accounting group will continue to be what one executive called it—Management's Right Arm."

Customer Activities

F. U. Naylor, sponsor
A. L. Code, co-sponsor

A credit code system outlined by R. C. Kiser, So. Calif. Ed., included: Unclassified—accounts without experience or not readily determinable. Preferred—usually assigned by the district manager; changes are not made without his approval. Established credit—has used service for 12 months and paid bills promptly or with less than three reminder notices; has used company service in another district and paid satisfactorily; presents good references. Impaired credit—always requires reminder, final notices more than 50% of time, field collector usually is necessary. Habitual delinquent—requires all notices, field collectors more than 75% of time. A special letter is written to this class recounting this expensive routine and informing him that in future service will be discontinued at expiration of final call notice.

According to J. L. Walbridge, So. Calif. Ed., now is the time to plan ahead, to call on experience and pre-

pare to meet potential problems such as meter reading. "Whatever we do and however we do it, we should first prepare our customer. We should tell him the complete story," Walbridge advised.

Because of diversity of interests, women and parttime school boys previously resulted in poor meter reading. Several utilities have gone to bimonthly reading and consideration has been given to a quarterly basis. If this should be used, it might be in order for all utilities to meet and predetermine staggered billing cycles, he suggested.

Similar difficulties will be encountered in the bookeeping sections. Turnover is not so noticeable in the clerical group but wives of men in service have been found to be good clerical employees, he said.

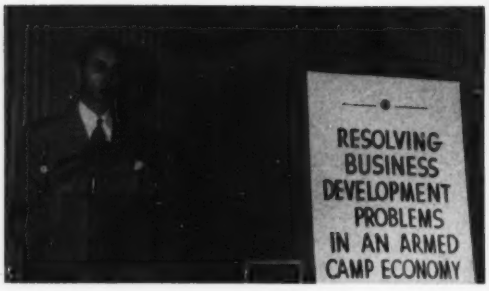
All this calls for long-range planning within the industry. A better and bigger job of training must be done, and supervision is going to play an important part in the success or failure of any such program. Greater tact, patience and diplomacy in handling the most minor matter will be needed to maintain good public relations, he reminded. Additional sacrifices and contributions to the war effort will have to be made.

"But let us never forget," he urged, "that, once this conflict is over, we should run back to normal just as fast as our old legs will hustle us and away from restrictive regulation and regimentation."

Personnel

J. A. DeGroot, sponsor

War and Pieces (Not by Tolstoy) was the title of the skit put on to portray personnel department problems. Players were F. E. Avery, So. Calif. Ed.; A. V. Hansen, Calif. Elec. Power; A. J. Noia, PG and E; H. S. Schuler, Westinghouse. DeGroot was moderator. The scene was the office of a utility personnel manager, complete with blonde secretary (Schuler). Suggestions brought out in the seven scenes included: personnel people should be well acquainted with the State Employment Office so that it will know their needs; World War II training problems should be brought up to date and used again; although employment of draft eligibles could cause a large turnover, many men will be needed when the emergency is over and it would be well to have good ones on tap; headaches can be eliminated by being sure that personnel people are familiar with requirements of the 1938 Selective Service Act; complaints of unfair treatment from the boss often are proved untrue; should be discussed with employee again after investigation; before financial support is given to employee organizations, it should be determined that money will benefit almost all employees, not just a few; the smart personnel manager is the one who plans for replacement of men he expects to lose and has complicated jobs broken down into simple steps; a wage stabilization director might be established to act as a central clearing point.



Mendes

Courtright

EEI-AGA Meeting

On Tuesday afternoon, Dexter Stoner gave a first-hand account of the National Conference of Electric and Gas Utility Accountants, held last April in Chicago. He recommended a study of the conference report, which will be mailed to all representatives of the Edison Electric Institute and the American Gas Assn., and can be secured from EEI headquartes in New York.

Business Development

Rodger I. Mendes, chairman
H. C. Rice, vice-chairman

Speed! variety! brevity! These characterized the fast, full and pertinent twin sessions of the Business Development Section, ringmastered by Rodger I. Mendes, PG and E., San

Turnbull Chamberlain Kaufman Perkins Henry Wells Meise

Cline, Eliker, Sylvester, Harper, Fenner Ferris

Francisco. For in two half-day sessions 41 people spoke in short, terse single-phase comments on the aspects of 11 committees' works. And the red and green light timing of each kept the meetings rolling at fast pace to end precisely on time. Seldom have so many salesmen spoken so much in so short a time.

Mendes began the parade, briefly reviewing the work plan the section has set for itself—(1) to decide on a purpose for each committee that would benefit the industry; (2) survey the problems needing solving; (3) select an objective for the year's work and (4) develop a method for accomplishing it. What had been accomplished or developed by the 149 association members on these committees was then passed in quick-step parade.

H. H. Courtright, PG and E, Fresno, struck the keynote of the Monday session by saying that change, which is the order of the day, is a challenge to the initiative of the industry. Population is increasing, industries are expanding, the area is growing. "To us all this change means opportunity, a challenge to do a better job, to grow bigger and render more service. If we do not keep molding opinion by advertising, promotion and direct field activities we could lose our share of the customer's business and our position in the market would be lost. This is a job we must do in our cooperative way."

Adequate Wiring Committee

J. H. Adams, chairman

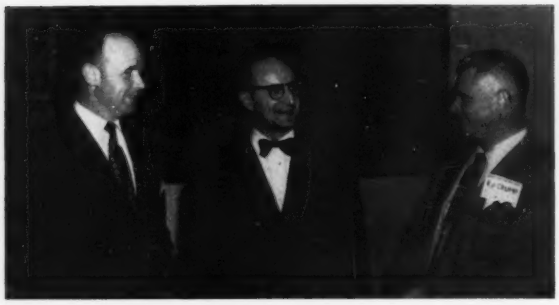
That now is no time to stop working on wiring adequacy, despite war emergency, production problems and shortages of materials, J. H. Adams, So. Calif. Ed., maintained as he called on manufacturer, distributor, contractor and utility representatives to tell how they are meeting the challenge.

Most promising in saving copper, said D. F. Flinn II, G-E, is the low-voltage relay control of switching for lighting and even other uses. An average house wired with conventional methods requires 26.3 lb of copper and 176.96 lb of steel. The same house wired with low voltage takes 21.1 lb of copper; 116.36 lb of steel, saving 20% of the copper, 34% steel. Another important contribution can be made in commercial and industrial lighting control of 480/277 v, 3-phase, 4-wire systems. Such a system results in copper and steel economies way back to the substation. With the relay mounted in a box at the fixture rated 5 amp, 277 v, only 24 volts are brought down within reach of those in the building.

Because each year the average use of kwh per home is increasing, because people conserve during tight periods by delaying purchases of new things but do not stop using their ranges, refrigerators, lights, television and other appliances, Elbert B. Kramer, Wesco, urged electrical distributors never to cease stimulating their salesmen to keep selling the idea of adequate wiring. Since these men are in daily contact with electrical contractors, merchandising dealers, realtors and builders, wholesalers' men should bring them constant reminders of the fundamental necessity for A-W to their customers. He urged more wiring displays in showrooms, both wholesalers' and dealers.'

Although wiring promotion has previously been aimed at residential construction, said Matt Sherwood, National Electrical Contractors Assn., he urged that scarce materials now be directed to improving the efficiency of industrial installations engaged in the war effort. Citing uninterrupted operation of equipment, meeting expanded production demands, conserving man hours by minimizing breakdowns, maintaining voltage to increase production and save consumption, minimize repairs and replacements, provide capacity for adequate lighting and power factor correction as the benefits to be gained by industry, Sherwood told what NECA is doing to promote the program. He told of the business promotion, interdependence, system records, survey, preventive maintenance, construction engineering, research and education, code and standards and governmental af-

Courtright, Winter, Ridout, Kramer, McCutcheon, Meise, Rosen, Ross, Van Law, Adams, Flinn, Vaughn (second row).



Walsh Gibson Crump

Reichard Falge MacKenzie Hartmann

fairs programs of that association to qualify contractors to handle their responsibilities in the defense effort.

Speaking for the utilities J. S. C. Ross, PG and E; E. W. Meise, San Diego G&E; W. E. Vaughn Jr., Calif. Elec. Power, and T. L. Van Law, So. Calif. Ed., each described what programs they were carrying out in wiring promotion. All said their companies intended to continue promotional work, and felt it to be good insurance against the future. Vaughn told of the formation of a new association by contractors of Riverside and San Bernardino and of the steps taken to prepare a program, which both the private and public utilities and entire industry are now undertaking.

Home Lighting Committee

Maxwell Rosen, chairman

Contending that the present low state of home lighting has been caused by neglect of vital education and promotion, E. E. Coleman, G-E Lamp Dept., said a return to fundamental lighting instruction of the public must be made. The effort expended in the Better Light—Better Sight programs of the past have worn off. Even the industry itself has forgotten the fundamentals taught in that program. He suggested that all go back to and use those basic truths about light and sight. Of some 66 "gimmicks" or methods to promote residential lighting he mentioned seven — (1) slides and canned sales talks; (2) recipes for home lighting, 26 of them; (3) plans for demonstrations; (4) slides for home builders, in color; (5) TV shorts, 50 seconds; (6) "Father sees the Light" films; (7) catalogs, with 20 manufacturers cooperating.

That good lighting has almost disappeared from the American home, with consequent eye impairment; that this means loss of lighting load, (fixture manufacture has lost 80% of its potential market, retailers sell only to a luxury class, and contractors are also losing a good market) was the contention of H. H. Allison, Sylvania Electric Products. He then suggested a program by utilities to educate homeowners, another by suppliers to reach furniture and department stores with education; one by distributors to get stock on dealers shelves. He envisioned a complete, long-range program.

However, A. J. McCutcheon, San Diego G&E, described all that his company was already doing in promotion and asked for more participation in it from dealers, distributors, manufacturers and contractors. Rosen concluded the committee's session by urging all utilities to do as much. He also suggested that some of their billboards be used to advertise home lighting modernization. Wholesalers now have fine showrooms displaying fixtures to which dealers can bring their customers. They furnish catalogs, mats with which to advertise fixtures and they have trained men to help dealers and contractors to design installations. He ventured that if dealers find appliances in short supply, rather than turn to toys or novelties, they might find fixtures a more fitting line to sell.

School Lighting Committee

H. H. Robison, chairman
R. J. Crump, vice-chairman

Daylight and artificial light for school classrooms are both receiving more attention these days than ever before. This was evident above and beyond the sparring that was done for each in the school lighting committee reports. In the absence of H. H. Robison, PG and E, Oakland, R. J. Crump, UCLA, presided over a stimulating and outspoken session.

Always bravely frank, Charles D. Gibson, Division of Schoolhouse Planning, California Department of Education, Los Angeles, let chips fall where they fell. He asked the electrical industry to consider both daylight and artificial light as light and to do more to improve the quality of all light in classrooms rather than merely sell quantity. His paper is so pertinent and pungent that it will be published in more complete form later. He not only dissected the present status but indicated trends in school planning and set forth the division's objectives for classroom lighting.

John S. Walsh, PG and E, San Francisco, then reported on progress of a study being made with a recording light meter in a modern type of daylight-designed school in Contra Costa County. Lighting levels for the entire school day are recorded so that the portion of each day during which clouds or fog reduces lighting intensity to below recommended standards is not a matter of opinion. Full results of this test are to be made public after it is concluded and the data evaluated.

After showing slides of many trends in school design, Roy Dahlin, So. Calif. Ed., said his company was ordering a recording light meter with which to conduct similar studies in cooperation with the state department. Dahlin felt that trying of new ideas was healthy and beneficial if the aim was always to better results already obtained.

Farm Handbook and 4-H Clubs

E. G. Stahl, PG and E, San Francisco, reported on the progress of both the Agricultural Power Handbook and the 4-H Club Committee. The third edition of the handbook is expected to be in the printer's hands by fall. The second edition, Stahl said, 10 years old, now out of print, was the best of its kind. Third edition includes modernization, added new developments and uses to bring it up to date. Although the EEI farm handbook is fine, it does not fit the 50,000 kwh per farm per year of pumped California farms.

With a change of administration the Extension Service, which had not

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¶ The ability to meet such situations results only from skilled foresight and careful planning. An association is the medium for the exchange of many of the ideas which go into such planning, and the Pacific Coast Electrical Association has served that purpose in the electrical industry of this area for the past 34 years.

¶ 250 company members and over 3,000 individual personal members are benefitting by using it as a forum for the discussion of mutual problems, and as a source of information on industry programs and activities.

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Jaeger and Kitchen-Laundry

looked with favor on business cooperation with 4-H clubs, now favors such help. J. Earl Coke, new director, favors such work if sponsored by an association. Stahl detailed the phases of the program being handled by a PCEA committee and urged that it be continued next year. During the past year 279 leaders were trained, 2,305 4-H members were enrolled and the number is increasing, 27% of them being new members. He felt that next year 5,000 would enroll in the electric course.

Agricultural Electrification Committee

S. H. Winter, chairman

Although the farm home may have lights and a refrigerator, Steve Winter, General Electric Co., chairman of the Agricultural Electrification Committee, maintained that not enough of the farms, especially small ones, make full use of the electric hired hand. He enumerated a number of fields into which more electric usage might develop, especially as the farmer faces manpower shortages and high labor cost. Among these he mentioned farmstead lighting, infrared heating and brooding, more motorization, barn cleaners, heat pumps. He next showed on charts results of a survey of farm leaders made by *Electricity on the Farm* which indicated that farmers want more educational advertising to acquaint them with available equipment. The survey also showed they believed activities to educate should be increased.

W. James Ridout Jr., editor of *Electricity on the Farm* was then asked to speak. He complimented California farming for its progressiveness and the degree of electrification but showed that more could be done with the small users of electricity to show them other applications for energy besides pumping of water. He also mentioned community betterment programs of some eastern utilities and emphasized the importance of youth programs such as 4-H, as investments in the future of America.

Television Committee

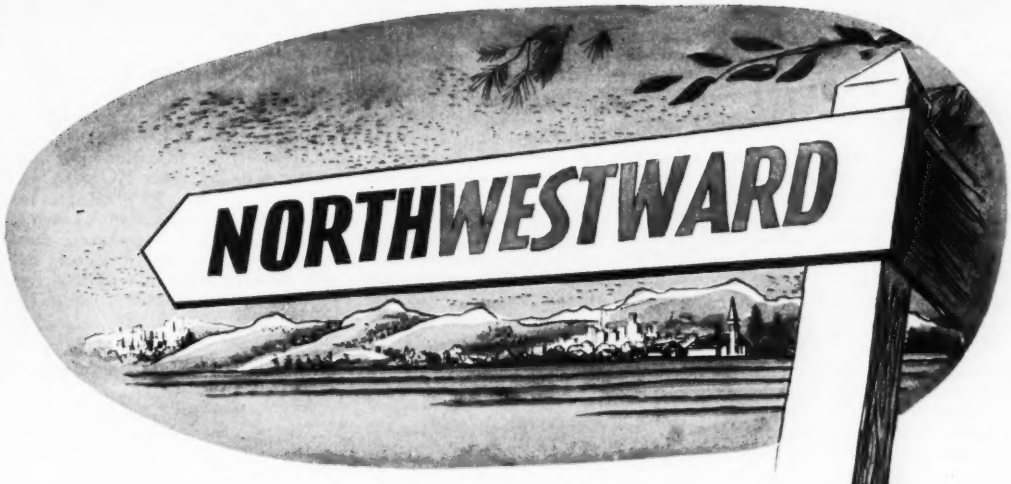
J. Clark Chamberlain, chairman

After being assured by Ray Turnbull, G-E, who keynoted the second or Tuesday session, that ex-G-E's Charles Wilson planned that the nation would have both bullets and butter, spectacular newcomer, Television, came in for consideration. Turnbull had pointed to surpluses of inventory in appliances in present supply instead of the predicted shortages, perhaps a temporary condition. He reminded that the industry is dealing with a parade of people not a set crowd and the parade is moving westward with its needs for electric living unfulfilled. He commended to everyone's thinking: (1) Courageously to evaluate the potentials of the market; (2) Recognize the value of repetition in the education of new families to the advantages of electrical service; (3) Aim high and aim ahead. H. C. Rice, So. Calif. Ed., section vice-chairman, presided over the Tuesday meeting.

Television, said Parsh L. Henry, L. J. Meyberg Co., who described its "Growing Pains," has followed the same pattern of "blitz, bust, boom" in each of the markets into which it was introduced. But in spite of obstacles such as the color controversy, UHF, government restrictions, shortages, it continues to grow. It has quickly become an essential of living. It has become a billion dollar industry in receivers alone in four years. There are fewer repossessions than with other appliances. People are beginning to buy the second set. Picture size is increasing. As the FCC unfreezes channels more markets and business will develop. With coaxial cable and relay transmission new program and newscast interest will develop.

Marshall Wells, Sues, Young & Brown, attempting to gage the "Outlook for the Future," quoted that "You can't lie fast enough to keep up with the truth about TV." He too reviewed the impact of TV on the public and the industry and other industries, such as theaters, books, sports. Yet the future was not wholly unpredictable. He told of FCC's freeze of channels and subsequent decision to release UHF channels. UHF experiments in Bridgeport have been encouraging and many such stations may soon be under construction. The sale of sets can grow from present 11 million to from 40 to 50 million. Color TV is only retarded now by argument over which color system should be adopted and lack of materials under present restrictions. Means whereby TV can bring a box-office return (Phonevision) are being tried out and received enthusiastically. Community antenna systems will provide TV to shadow areas and engineering skills will develop sets of high efficiency with a minimum of critical materials. The comet-like industry's future is high and bright.

There are about as many good service plans as the total number of trademarks and servicing contractors, said L. J. Perkins, G-E Supply Co., as he reviewed the variety of them. He also recounted some of the bad experiences both service contractors and public had had with inadequately financed or poorly organized service guarantees. However, dealers and service contractors are streamlining operations to eliminate nuisance calls and hasten needed service. Bills to examine and license are being opposed by dealers and distributors who say licensing is no cure for dishonesty. He surprised with the statement that Western Union Telegraph Co. is considering entering the TV service field. He predicted that before long many factors would reduce service headaches—standardization of tubes, parts, designs, new manufacturing techniques and that the RTMA 90-day radio warranty plan would prevail.



. . . the Course of Empire Takes Its Way!" . . . Rapid, efficient development of the area's vast natural resources of electric power, fertile agricultural acres, mineral wealth, and timber has meant rapid increase in population, markets, and prosperity.

One of the vital factors in this progress toward a future unlimited in the Northwest is effective generation and distribution of dependable low cost electricity, and the promotion of its use for better living for all.

The Northwest Electric Light and Power Association is the medium through which leaders of the electrical industry—utilities, service companies, manufacturers, contractors, wholesalers, and dealers—have coordinated their efforts to make the area a world leader in generation and use of electricity.

In rendering service to the public the American private enterprise way, the Association and its members have stressed *service* and *enterprise*—for the greater good of both the public and the industry.

Business managed electric companies will invest $550 million in generation and distribution facilities in this region in the five-year period 1951-1955, and provide 1,446,000 kw. of new generating capacity.

NORTHWEST ELECTRIC LIGHT AND POWER ASSOCIATION

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Clark Chamberlain concluded the TV session by reminding members what the TV committee itself has done to dissipate confusion and improve sales and service training. The TV Newsletter prepared by it bimonthly tells the facts about the controversial issues and keeps dealers better informed. The newly prepared manual to guide in setting up a TV sales and service training program, edited by Dan Turner of San Diego G&E, already is meeting enthusiastic demand.

Commercial-Industrial Lighting Committee

F. M. Falge, chairman

How lighting can help in the defense effort was reviewed from the last war's experience by F. M. Falge, G-E Co., Lamp Dept., Oakland, chairman of the committee, before turning the session over to Charles Long, Westinghouse Electric Corp., Los Angeles, to mc. "Light information, please," said Long, is what the plant managers are asking. To give them that information pleases them. Many new personnel are in need of such information, because those who had the training have moved up or away. The information the lighting industry has is of no value in the files, it must be put to use, Long reminded the groups.

Speaking for educators and schools which must train many people for the armed camp economy, Ralph Crump, UCLA, said his problem was in getting materials even to complete buildings already started. Already school designers are being asked by contractors to accept substitutes. He hoped the industry would take more care and time in designing substitutes. Going back to fiber board reflectors for lighting and knob and tube wiring for school buildings that must last a hundred years is not sound economy, he said.

Although original installations may be well engineered and installed, said Benn J. Hartmann, Flood-Lite Service Inc., Los Angeles, systematic maintenance is often neglected. Thus efficiency both of light and of those who work under it are impaired. Adequate light, properly maintained, has a direct bearing on the quality and speed of work. Outdoor lighting equipment maintenance must be systematic too, for outages handicap policing, exposure to weather hastens deterioration and outages occur usually at night when repairs cannot be made conveniently.

By a simple test conducted on the platform, Emerson S. Reichard, General Petroleum Corp., proved that neither of his three test subjects, Falge, MacKenzie or Hartmann, preferred the same lighting level, whereas all could barely see at a very low intensity. He concluded that most people like more light than present practical limits, that since eyes will function satisfactorily under adverse conditions they should not be used to determine the intensity needed, and hence a higher target of illumination as well as visual means of demonstrating the need for such levels are needed.

Reports that the Munitions Board had placed 18.1% of prime contracts in California imply that even greater demands will be made on lighting men than before. But as demands increase, availability of materials and men decrease, said Jack Rohring, So. Calif. Ed., in covering the utility approach to lighting in a national emergency. But utility personnel have more experience and knowledge now with which to meet this challenge. Rohring made an interesting observation that during the last war little was done in plant office lighting and with small plants because of the strong emphasis on large industrial lighting. This was caused partly by scarcity of office lighting equipment. But now equipment is available and more assistance can and should be given to these offices and small plants, Rohring urged lighting men.

Home Economics Committee

Miss Lois Ferris, chairman

All through the convention the 16 attractive home economics girls wore large cards saying, "Look what the Home Ec Gals are Doing." What they did to the afternoon session was to brighten and enliven it aplenty. Lois Ferris, Westinghouse Electric Corp., chairman, introduced the girls, an exceptionally large and representative group. Marguerite Fenner, PG and E, then summarized what the home ec girls had been doing: (1) Prepared an electric range textbook for use in schools, written in simple familiar words and illustrated to explain any unfamiliar words. (2) Conducted Electrical Living Institutes for teachers, to train them to teach their students and the public the ways to achieve electrical living. Two more are being planned for the fall. (3) Conducted classroom demonstrations to aid teachers in the schools themselves and from this developed a simplified demonstration that would fit into the limited time, one that produced food that could be eaten and tasted. (4) Insisted on and aided in getting modern equipment in the schools. (5) Sold future homemakers —the students today who are to be the homemakers of tomorrow. (6) Conducted equipment workshops in which to train home economists and demonstrators for their work in the electrical industry. Two of these have just been successfully carried on. (see p. 88, May issue.)

To illustrate what overselling does to customer relations, a clever skit was presented by Marjorie Harper, G-E, and Joady Dryden, So. Calif. Ed. In it a young housewife complained of being sold or given appliances and not understanding what she could do with them. The moral was to have capable demonstrators teach and really sell the homemakers.

Kitchen and Laundry Committee

E. W. Meise, chairman

That there is a potential of 8,265 kwh per year from kitchen and laundry appliances if the industry will again get promotional and really sell, was what A. H. Jaeger, Hotpoint Inc., illustrated by a big pie chart. The details of this talk, originally scheduled to have been given by Howard Scaife, are so important that the paper will be presented in full in a later issue. In fact time did not permit Jaeger to present it in full either. One of the surprising charts that he showed was one that told national saturations of electric ranges are now above those for the states of California and Arizona, and that load growth in the West too has lagged behind national trends.

Liquified Petroleum Gas Committee

W. F. Lambrith, chairman

Reddy Kilowatt now has a competitor with sex appeal, "Little Elpee." This was the warning that Dale MacKenzie, G-E, gave as he showed drawings of the liquid petroleum gas industry trademarked symbol, a cute little miss with flame hair. "I have never yet known a woman without a purpose," he said as he showed some of the selling and promotional program of the LPG industry to take the range and water heater business away from the electrical industry—$5 million in the next few years. He then went on to say that the facts and figures are all in favor of electricity but that neither dealers nor consumers are yet aware of these figures. The efficiency ratio is 10 to 1 for electricity over LPG, in refrigeration, 3 to 1 in cooking and 2 to 1 in water heating. In concluding he urged that the electric industry make up its mind to start a program. Enough data are available. The situation, he said, calls for aggressive, unified action.

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Straub Hansen

Operating Economies

A. A. Straub, chairman
Alf Hansen, vice-chairman

The practice of holding a number of parallel sessions of the Operating Economics Section gave way this year to two general afternoon meetings. These were well attended. Several of the section's committees contributed to the program. The steam committee had C. C. Whelchel, PG and E, review present steam plant practice. Whelchel said, "steam turbine design continues to be influenced primarily by the desire to increase efficiency and decrease fuel consumption per unit of output. Each 25° increase in throttle temperature decreases fuel consumption approximately ¾%. Higher temperature also makes possible the effective use of higher pressure. This further reduces fuel consumption. Thus, increasing throttle temperature, and to a lesser degree pressure, has a very beneficial effect on the efficiency of steam electric generation.

"The acceptance of reheat undoubtedly has been influenced by the increased cost of fuels and the generally higher steam plant load factors. These have made it possible to improve thermal efficiences above those attainable with non-reheat cycle. Another very important influence which stimulated the renewed interest, and which came about because of improved boiler reliability, is the single-boiler single-turbine arrangement now so widely used. This turbine and boiler grouping has made the problem of starting, stopping and controlling reheat units much simpler than in the case of an interconnected system of multiple boilers and turbines. Also, many operators who have had reheat cycle for years have experienced no serious difficulties. Reheat results in about 5% improvement in the heat rate directly, and an additional 2% because of the reduction in station auxiliary load.

"While there may be some reason to believe that we are approaching another plateau in steam station design, I do not think so. As equipment becomes more reliable further simplification in station design will result. Also we must remember that steam pressures can be increased far above those now in use. Boiler builders tell us that the only limit that they know of is the economic one. I feel reasonably sure that a 5,000-lb forced circulation boiler would be made available now if it could be justified economically. Steam temperatures have certainly not reached their ultimate at 1,100°. Known research programs now in progress include tests on Austenetic alloys up to 1,600°.

"Opportunities for additional savings remain, and these are under continuous study. There is good reason to believe that the record of past achievement set by the power industry during the past five years will be equaled or surpassed in the immediate years ahead."

Air Switches

Installation and maintenance problems of air switchgear were covered by W. H. Peterson, PG and E, and R. F. Gibbons, Pacific Electric Mfg. Co. Peterson said that operating mechanism of high-voltage switches use gear requiring heavy operating parts. This slows down operating speed of the blade in the opening and closing of the blade swing. Harmonics from arcs have burned out coils in adjacent low-voltage circuits and are a source of television interference also. He asked the designer if it is feasible to increase materially the blade speed through the 45° of arc to and from the male contact.

More tolerance is needed, he said, in contact alignment and operating gear. In some cases so much leverage force has been required on operating mechanisms as to shear pins. Lubrication was another problem discussed. Why not incorporate a flush grease gun fitting of the Zerkite type, asked Peterson. Another question asked of the designer was, what is being done to provide a load interrupting device for dropping 60-kv loop lines up to 30 miles in length?

The last question was answered by Gibbons with the statement that there is no interrupting switch that will open long lines that does not approach the cost and performance of an oil circuit breaker. On the matter of lubrication, he recommended dry graphite or a recent new product with the properties of dry graphite but without some of the disadvantages.

Lake Adams

Milmoe Ludekens

Gibbons Peterson

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Underground Systems

Underground systems need more engineering, said C. N. Parker, Calif. Elec. Power Co. In California the underground systems have been almost orphans. With our wide open spaces and the higher cost of underground construction, managements hesitate to spend money for expansion of underground systems. With the tremendous increase in population during and after the last war, we are beginning to approach the load densities and the demands for underground systems that have been apparent in many eastern cities.

Parker reviewed underground practices of California utilities, pointing out differences in philosophy and construction methods. A common tendency is toward larger and longer manholes. Commenting on network units, he said, "network units being compact, complete and standardized, permits standardized arrangements of vaults. With radial systems this is not the case. Developments within the past few years of oil-filled sectionalizing switches, new types of connectors, moles and similar arrangements, have resulted in changes and simplified designs." He feels that there is still a need for an improved overcurrent device; one that can provide positive isolation and one that can provide simultaneous three-phase protection.

Pole Top Resuscitation

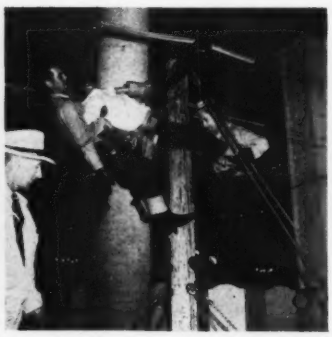
With the aid of a line crew of the Southern California Edison Co., the safety committee staged a skit showing the techniques of pole-top resuscitation. C. A. Fischback, So. Calif. Ed., explained that pole-top resuscitation is a technique by means of which artificial respiration may be given immediately to a lineman receiving a shock on a pole without the delay incident to lowering the victim to the ground. It is intended to supplement the prone pressure method and is for use as an emergency measure under those conditions where it is impossible quickly to place the shock victim in the prone position. Many lives have been saved as a result, Fischback said.

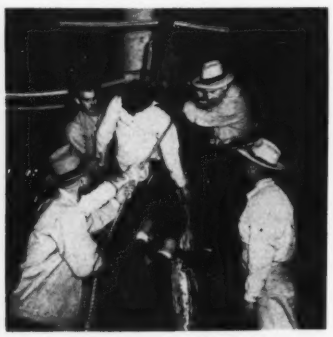
Series Compensation

A report on laboratory and field tests on the 230-kv series capacitor installation of the Bonneville Power Administration at its Chehalis substation was made by J. E. Barkle, Westinghouse Electric Corp. This installation was made to prove the practicality of the use of series capacitors to increase the power transferability of long high-voltage lines and to increase system stability. This is the first installation ever made where the capacitor by-pass protective circuit is automatically opened within ½ cycle after clearing of a system fault. The primary purpose of the tests was to determine transients caused by short circuits and switching and to investigate relay performance.

Barkle concluded: (1) that the problems of operating long transmission lines with series compensation are not insurmountable where a fast-growing capacitor protective device is used; and (2) that the problems of relaying such a system can be met with presently developed relay equipment if compensation is limited to 50% of the line inductance. Based on results of this pioneer installation, he feels that series compensation of high-voltage transmission lines offers great

Pole-top resuscitation was demonstrated by a group of Southern California Edison Co. linemen for the Operating Economics Section





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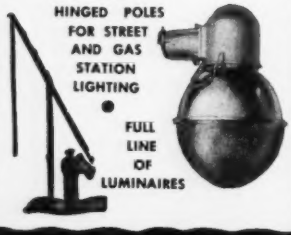
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Tie Line Load Control

Companion papers on tie line load control were presented by Clyde Clevenger, So. Calif. Ed., and Frank I. Lawson, PG and E. In its simplest form, the problem of controlling tie line load is two-fold, said Clevenger: (1) to measure the load on the tie, and (2) to use this measurement as the basis for controlling generation. To accomplish this, telemetering and control on the Edison system required some 1,600 miles of carrier channel, 1,200 of which are on 220-kv transmission lines, with 400 miles of telephone carrier.

General Electric narrow-band, crystal-controlled, frequency-shift carrier equipment is used on the 220-kv grid, coupled phase-to-ground, and without the use of wave traps, except where they were provided as part of the original station construction. The carrier transmitters operate at 2-w output in the range of 45 to 200 kc. Lenkurt telephone carrier is used throughout and is of two basic types: (1) audio-tone, narrow-band, frequency-shift channels, superimposed on pilot-control channels of stacked carrier voice circuits, and (2) narrow-band, low-frequency stacked-carrier channels on the shorter lines. To instrument the tie line load recording and transmitting, and to perform the function of controlling generation, Leeds and Northrup impulse-type equipment has been installed.

PG and E has an equally comprehensive program for tie line load control, said Lawson. In addition to facilities for controlling ties with the Southern California Edison Co., PG and E is applying tie line load control to subdivide governing duty automatically to several plants, in a program of sectionalizing the system for load purposes into three major operating units. Under the plan the control signal in the form of a tie line load reading will go directly to the plant exercising the control. This is in contradiction to the plan of operation where readings on ties are transmitted to the system dispatching center and the governing signals are sent out from there.

Signal to noise ratio is the important thing in television interference, declared R. E. Lake, PG and E. A signal to noise ratio of 20:1 is ample for good reception of AM radio signals, whereas, a ratio of 100:1 is necessary for satisfactory TV reception. That is, if the TV signal strength is 500 microvolts per meter, then the noise level should not exceed 5 microvolts per meter. The area within a 500-microvolt contour line is considered the primary area for good television reception.

Methods for locating TV interference are similar to those in use for radio. The antenna is very important, he said. A good antenna will raise signal level and at the same time help exclude noise. Usual causes of TV interference, said Lake, are: interference from continuous waves, spark interference, interference between television receivers themselves, diathermy machines, FM transmitters, "hams," door openers and arcing contacts of all kinds. "Leaky insulators" and "leaky transformers" are still the same old bugaboos they were in the early days of radio. Actually, they cause little trouble, said Lake.

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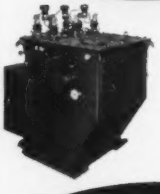
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General purpose enclosure — with or without pilot light

Water-tight and dust-tight enclosure

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THE MONTH IN BRIEF

Power Company Buys Municipal System

Utah Power & Light Co. has purchased the municipal transmission line and distribution system of the town of Arco, Idaho. Sale followed a permissive vote by citizens of the community. The $115,000 price included $70,000 for the distribution system, $30,000 for transmission lines and $15,000 for certain village improvements. Completion of the sale was held up by SEC hearings after the Lost River Rural Electrification Administration asked that the REA buy the property. SEC denied the petition by the REA, which reportedly was willing to pay $90,000 for the distribution system alone.

Hell's Canyon Dam Controversy

The proposed Hell's Canyon Dam on the Snake River called forth an interchange of words between Herbert G. West of Walla Walla, executive vice-president of the Inland Waterways Assn., and Holland H. Houston, power advisor to Governor Langlie. Houston said the dam would produce only 78,000 kw at a cost of $38 per kilowatt-year. West declared that 668,000 kw could be developed at a cost of $17.22 annually, "after considering all repayable costs as demanded by Congress." In reply, Houston described the proposed dam as potentially "the highest dam in the biggest hole in the world built at the highest cost per kilowatt of any project so far proposed in the Pacific Northwest." West criticized Houston for ignoring "vital navigation and flood control benefits," but Houston declared such benefits "do not exist."

San Diego G&E Schedules Steam Plant

A $12 million steam plant will be the first to be constructed on San Diego Gas & Electric Co.'s recently acquired site near Carlsbad, according to L. M. Klauber, chairman of the board of directors. He said that earliest possible delivery date for the 75,000-kw generator now on order would be in the spring of 1954 and that the station would be in operation soon afterward. The Carlsbad site, approximately 60 miles north of San Diego and close to the ocean, was purchased as the location for all future generating plant development by the company. The company's Silver Gate plant in San Diego will be completed in 1953, when the fourth 50,000-kw generator is installed.

Fish Commission Again Vetoes Dam

Effort to secure Oregon state approval for a power dam in the Deschutes River has failed for a second time. The state fish commission recently vetoed the $22 million Pelton project, holding that the proposed development would be detrimental to propagation of salmon. Despite the ruling, Portland General Electric Co., the applicant, will continue efforts to obtain a permit for a dam site on the Deschutes. Application for a FPC permit is still pending and PGE has applied for a certificate of necessity from the Defense Electric Power Administration. State permission is required, however, since the stream is wholly within the state of Oregon.

Proposed Federal Tax Might Increase Rates

If enacted, proposed federal legislation extending the 3½% federal tax on electric energy sales to include publicly owned systems might cause Seattle City Light to increase its rates, according to Bob Jones, utilities chairman of the city council. The measure, if passed, would cost City Light an estimated $840,000 annually. The city system cannot continue its present rate structure if more taxes are piled on it, Jones said. City Light already faces a $300,000 tax payment on Puget Power properties it took over recently. It sustains steadily mounting losses in compensation for street lighting, Jones said. The council budgets $350,000 for this service but new street lighting, when installed, will cost about $1 million a year for current and maintenance, according to figures of Superintendent Hoffman.

Rate Base May Be Challenged

An $11,443,892 rate base recommended by the Arizona Corporation Commission was about $8 million below that sought by the Arizona Edison Co. The company (which had asked $19,790,073 in an attempt to increase earnings by $351,298) indicated that the case would be carried to the state supreme court for constitution test on valuation. Arizona Edison claims its property should be valued on the basis of reproduction cost under present prices, less depreciation. The commission's rate division operated under a general order calling for a rate base figured on original cost, less depreciation, and elimination of all intangible items.

Los Angeles Planning $58 Million Plant

Los Angeles Department of Water & Power is negotiating for land in the San Fernando Valley for a $58 million steam plant. The development ultimately will consist of four generating units, with a total rating of 320,000 kw, and with a maximum output of 400,000 kw. This will approximate capacity of the department's Harbor steam plant, and may be compared with the 400,000 kw normally available to the department from Hoover Dam. The first two units of the new plant are scheduled for operation by 1953 and the four units by 1958.

Puget Power Steam Plant Offered For Sale

Puget Sound Power & Light Co. has offered to sell its steam heating system serving downtown Seattle. The plant, only company-owned property in Seattle since City Light took over the electric system, was built at an original cost of $2,500,000. Its revenues last year totaled $1,214,539, with net of $36,531.

Initial Units at Highgrove Scheduled

First of two 30,000-kw units at California Electric Power Co.'s Highgrove steam plant in Riverside will be on the line in mid-1952, according to present schedule. Rapid growth of the area has led the company to plan for a third machine, with 40,000-kw capacity, for operation in January 1954.

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HOW IT WORKS

Operation of the three phase unit is identical with that of the single phase unit except that a permanent fault on any phase causes the other two to lock out. Reclosing and resetting occur independently on each phase. If the fault clears after one, two or three reclosures, the unit affected resets for normal operation with no interruption of three phase service. On the fourth operation, the mechanism locks out all three phases and remains locked out until manually reclosed. When the sustained fault is cleared all three reclosers are reclosed manually by the simple operation of pushing one pull ring up into the protective hood.

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THIS MONTH'S NEWS

PUGET POWER SIGNS AGREEMENT WITH PUD

A 50-year lease and operating agreement, providing for immediate expansion by the district of the company's Rock Island hydroelectric plant, has been signed by Puget Sound Power & Light Co. and Chelan County PUD. The arrangement is subject to the district's ability to finance the expansion program by May 15, 1951.

FPC approval was secured last month for construction of six 25,000-kva generating units at Rock Island. Initial stage, completed in 1932, included four generating units with total capacity of 80,000 kw. The original license in 1930 provided that Puget Power should raise the dam, install additional circuits and generating units of such capacity and at such time as the market justified.

It is estimated that the expansion will cost $33 million. It will be financed by the district through sale of revenue bonds.

Under terms of the agreement, the expansion will not affect the present capability of the plant and Puget Power will continue to receive the output from existing facilities. The company will operate the additional facilities on a cost allocation basis as agents of the district.

The district has agreed to provide 120,000 kw from the new units to the Aluminum Co. of America up to June 30, 1955, and 60,000 kw from that date to July 1, 1956. The amount will then be reduced to 30,000 kw. After July 1, 1957, the Bonneville Power Administration will furnish Alcoa's total 170,000 kw requirement.

From Jan. 1, 1952 to July 1, 1955, Puget Power will receive from the district $82,500 annually, plus 50% of the revenue (minus certain stated costs for wheeling dump energy) received by the district in excess of that obtained from Alcoa. From July 1, 1955 on, the net annual cost of the additional facilities will be borne by the district and the company in proportion to the amounts of firm power taken by each. To the extent that firm power is not made available to the company from the six new units, the district will pay rental, varying up to a maximum of $480,000 annually.

It is expected that after July 1, 1955, a substantial amount of firm power will be available to Puget Power from the six additional units.

The district will build a transmission line from Rock Island to the Puget Sound region unless other arrangements are made for power delivery.

Deer Creek Dam Plans Nearing Completion

Secretary of Interior Chapman has informed the Provo Water Users' Assn. that construction of an 8,800-kw hydroelectric plant is contemplated on the Deer Creek Dam in the Provo River. Long discussed, the plan has been delayed until recommendations were available concerning the Central Utah project, with which the reservoir will some day be linked.

Reclamation Commissioner Michael W. Straus has called the Deer Creek project valuable for defense. Gus P. Backman, executive secretary of the Salt Lake City Chamber of Commerce, termed it unnecessary, noting that no shortage of power now exists in the region and that operation of Utah Power & Light Co.'s 66,000-kw Gadsby plant is scheduled for this year.

● **Imperial Irrigation District** board of directors at El Centro, Calif., has awarded three contracts under the district's 1949 power development project for additions to the El Centro switching station and relay house. The contracts totaling $117,830 are: Westinghouse Electric Corp., San Diego, power transformer and air-break switches; Kelman Electric & Mfg. Co., Los Angeles, oil circuit breakers; General Electric Co., San Diego, relay house, insulators, and instruments.

● **A $400,000 revenue bond issue** to cover improvements and expansion of Franklin County PUD facilities at Pasco, Wash., has been certified by Aldrich & Johnson, consulting engineers of Portland. The bonds will finance a new administration building, as well as transmission, distribution, and street lighting improvements.

TUCSON COMPANY WINS FRANCHISE ELECTION

The Tucson (Ariz.) Gas, Electric Light and Power Co. will pay a 2% gross tax on gas and electric business and will put the downtown electrical system underground, under terms of a 25-year franchise.

The franchise was voted, 3,532 to 1,941, after a bitter pre-election battle. A Tucson newspaper publisher led the fight to impose a 3% tax and the utility countered with full-page color advertisements answering his front-page editorials.

As soon as the franchise was voted, the company authorized $433,447 for initial expansion of the system. It already has a $7 million power expansion under way, including a 26,000-kw generating plant.

In proposing the 2% tax and improvements, the utility promised: (1) a 2% cut of the gross gas and electric business, with a minimum of $5,000 a month; (2) improvements of the downtown system, elimination of poles and installation of an underground system; (3) a saving in unnecessary interest rates on millions of dollars of new capital; (4) a sounder and more economical operating basis for the next 25 years.

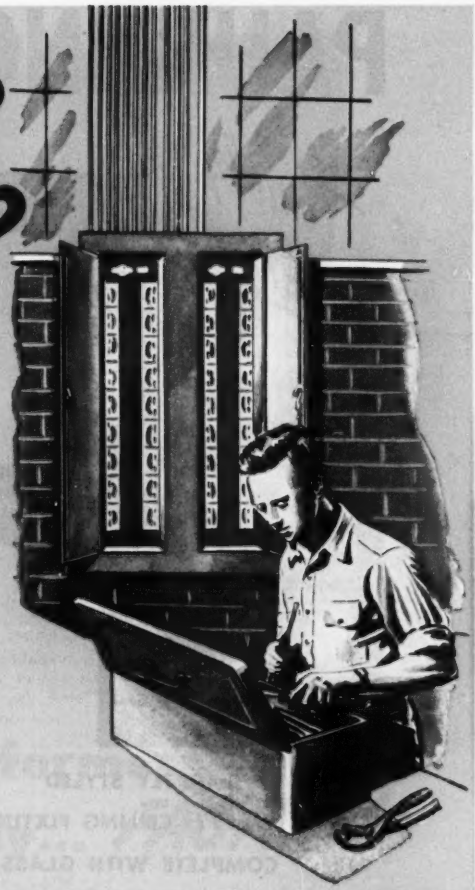
Stressed during the company campaign was the fact that the new tax would nearly double the power company's contribution to the city. Last year it paid $74,765. County taxes totaled $562,627 and state taxes $107,620 last year.

San Diego G&E Schedules 80,000-kw Machine

An 80,000-kw turbogenerator has been ordered by San Diego Gas & Electric Co. for installation at its Encina property, acquired some time ago. Delivery is expected early in 1954, and the plant is scheduled to be in operation by the end of that year. Estimated cost is $12 to $14 million. A fourth 50,000-kw turbogenerator is expected to be installed by the Silver Gate plant in the fall of 1952. It will cost approximately $8 million.

JOB FINISHED?

Are You Sure?



You *can* be sure that the job is finished for good if you use Triangle — the *quality* wire, cable and conduit.

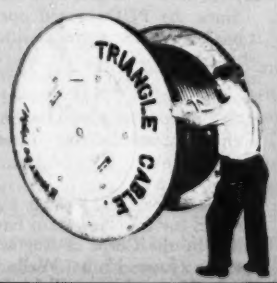
Today all electrical material *must be right!* Defense Plants particularly can't be allowed to slow down as a result of power failure.

Do it right the first time! Make sure the job is finished for good. Specify Triangle's Glazon Wire, Hot-Dipped Galvanized Conduit and other top quality Triangle products.

It costs no more to do the job with electrical material that is *right* from start to finish. Throughout both of Triangle's Plants you'll find this watchword:

"It Must Be Right"

When you specify Triangle, you can be sure it *is* right!



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Once again lighting trends are turning back to overhead illumination and ceiling fixtures. This makes Paulding's #1674 and #1675 a popular and timely twosome. These two smart, simple, easy-to-clean ceiling fixtures disperse and reflect good light without glare. Paulding's unsurpassed quality at competitive prices guarantees your money's worth.

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Paulding's #1674 and #1675 are ideal for ceiling installation in Kitchens, Halls, Bedrooms, Offices, Laboratories, Washrooms, Basements, Vaults, Corridors, Playrooms, Dining rooms . . . or wherever "natural" electric illumination is desired overhead, with either Wall Switch or Pull Chain control.

SPECIFICATIONS AND RATING

Both #1674 and #1675 are furnished with glass. Each is completely wired and equipped with a mounting strap for 3¼" and 4" outlet boxes. Both have base diameters of 6½" with a 4" fitter. However, #1674 is keyless and is rated @ 660W-250V. #1675 has a Pull Chain and is rated @ 250W-250V. Both are approved by Underwriters' Laboratories.

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See Paulding's Line in SWEET's Architectural File.

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NEW BEDFORD, MASSACHUSETTS

QUALITY SERVICE SATISFACTION

PUD METHODS REBUKED BY AUDIT DIVISION

Northern Wasco PUD has been rebuked by the Oregon state division of audits for alleged inefficiency in the conduct of its business. The audit criticizes the system used for job orders and work orders, lack of maps showing installations, failure to set aside 5% of gross operating revenues for payment of principal and interest on bonds, inefficiency of records on merchandise and materials sales, and failure to prepare and publish a budget.

The criticized report shows the district, which serves approximately 750 customers in Wasco County, operated at a loss of $27,402 between July 1, 1949, and December 31, 1950.

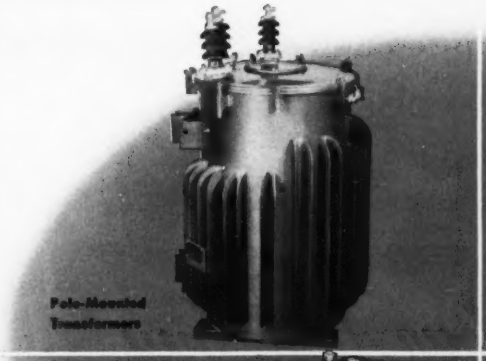
At the time the state agency was heaping criticism on the district, President W. J. Seufert announced the PUD intends to seek authority at an election in September for issuance of bonds to acquire The Dalles properties of Pacific Power & Light Co. Directors of the PUD recently engaged the services of Tudor Engineering Co., San Francisco, to make a study of PP&L properties.

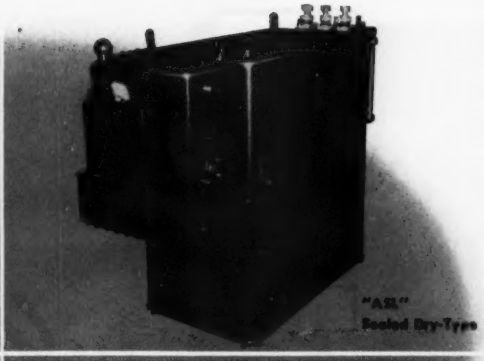
Liabilities of the district, as listed in the report, include $275,000 in revenue bonds and $36,321 in other debts. Among these other debts are $4,430 in unpaid property taxes, and $6,303 owed the Bonneville Power Administration for wholesale power delivered between July and December 1950.

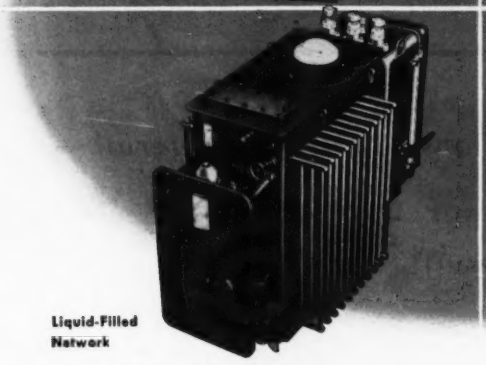
Since the PUD started operations, it has been in competition with PP&L, which filed a new rate schedule to meet a 20% lower rate put into effect by the district. The reduced PP&L rate was approved by Oregon Public Utilities Commissioner George H. Flagg.

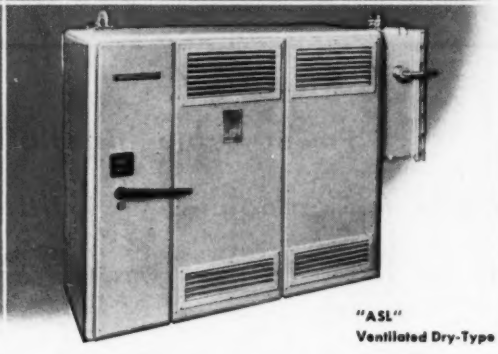
● **Bids** for six 111,300-hp hydraulic turbines for McNary Dam have been called by the Corps of Engineers, for opening June 15 at Walla Walla, Wash. The turbines will be for units 9 to 14. A contract for four turbines, for units 5 to 8, was awarded in January 1950, to the S. Morgan Smith Co. of York, Pa., for $4,974,090. The same company holds the contract for the first four units.

● **Grant County PUD** of Ephrata, Wash., has filed a $60,000 suit against the city of Ephrata, charging that a new street grade level damaged the PUD warehouse. A change in the grade of the road was made illegally, the PUD charges.


Pole-Mounted Transformers


"ASL" Sealed Dry-Type


Liquid-Filled Network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Let us talk them over with you and point out the specific economies that can fit into your plans best. In addition, our complete facilities . . . engineers and calculating boards . . . are available to help you make future expansion more economical. Ask your Westinghouse representative, or write for booklets B-4028 and B-4002A. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.
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*National Electric Code—Chapter 10

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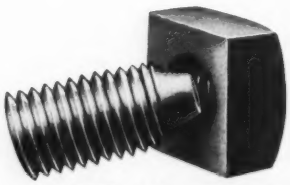

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CONGRESS URGED TO ABOLISH "PREFERENCES"

Congress is urged to abolish "preferences" now given to public agencies in the sale of electric power, in a resolution adopted at Seattle by public utility commissioners of 11 Western states. Introduced by H. N. Beamer of Idaho, it asks that power generated at federal projects be made available to "all citizens and users without discrimination."

The preference policy discriminates against power users served by regulated utility companies in favor of public power groups, said Beamer, and "tends to force a change from private to public ownership of electric distribution facilities."

Beamer believes that "socialization of a large part of the electric industry in the West will inevitably result unless this trend is halted."

CIO Seeks to Regain Bargaining Rights

The CIO Workers Union of America is seeking to regain bargaining rights for Pacific Gas and Electric's 12,000 physical workers in northern California.

Until 1950, the UWUA-CIO represented 5,000 physical workers (production, maintenance, power house, and construction crews) in the San Francisco area, while the AFL International Brotherhood of Electrical Workers held contract rights for 7,000 workers in all other divisions. In January 1950, a system-wide election was ordered by the National Labor Relations Board, and was won by the AFL.

The UWUA, however, maintained its organization in the San Francisco area, continuing to negotiate certain grievances. Some 3,600 pledge cards will be necessary to petition for new balloting, under NLRB rules. The UWUA claims to have more than 2,000 signed cards now and expects to have the rest within the next two months. The election petition must be filed by the end of June.

● **E. R. Hoffman,** Seattle City Light superintendent, has asked the city council for a $495,000 appropriation to provide housing for operators of the Ross power plant, now under construction. Since no site is available in the narrow Skagit River gorge at the Ross plant, the housing will be constructed seven miles downstream at the Diablo power plant.

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DURALINE* provides added assurance against power outages caused by moisture, whether in the form of rain or sleet or snow. Duraline won't festoon, is more resistant to damage by foreign objects.

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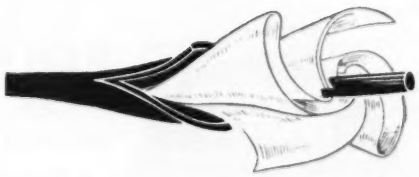

DURALINE beats the weather in any season. Its exclusive, continuous interlocked fibrous sheath is thoroughly impregnated with genuine URC saturants and covered with URC finishers. 51346

For the full technical story on Duraline with copper, Copperweld or aluminum conductor, just contact your nearest Anaconda Sales Office. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

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Anaconda on the Pacific Coast Plant at: *Orange, Calif.* District Offices at: *Los Angeles, Calif.; San Francisco, Calif.; Seattle, Wash.*

SMALL BUT IMPORTANT

Power connectors are amongst the smallest devices that go into a power system. Nevertheless failure of even one connector can be costly. Use of reliable Three E power connectors is one way of avoiding a lot of trouble.

Three E Clamp Style Power Connectors are:

1. **Accurately designed as to cross sectional and contact areas.**
2. **Made of high grade copper or copper alloy with high strength alloy bolts.**
3. **Carefully Manufactured.**
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These features plus time tested performance give assurance that you will

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Bar tap for tapping 4/0 cable to 4" bar

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POWER FACILITIES ASKED FOR WILLAMETTE PROJECTS

Modification of construction plans for two dams in the Willamette Basin flood control project in western Oregon to add power producing facilities has been proposed in Congress by Senator Guy Cordon of Oregon. The two projects, Cougar Reservoir on the south fork of the McKenzie River, and Green Peter, on the middle fork of the Santiam, have been authorized by Congress for flood control and related purposes.

The proposal calls for installed capacity of 25,000 kw at Cougar and 81,000 kw at Green Peter. In conjunction with the Green Peter project, it is proposed to build a reregulating dam at White Bridge with installed capacity of 10,000 kw.

Tacoma Again Pushing Water Heater Installations

Tacoma, Wash., City Light has reopened a promotional activity under which it subsidizes the installation of electric automatic water heaters.

Under this program, it pays the cost of a normal installation in a single-family residence, on a time and material basis, of any heater of 50-gal size or larger where it replaces a side-arm electric water heater, provided the old heater is returned to City Light. New residences are excluded. A "normal" installation is considered one costing not more than $50.

In the case of a dealer who is also the plumber, City Light pays a flat $25 for the installation.

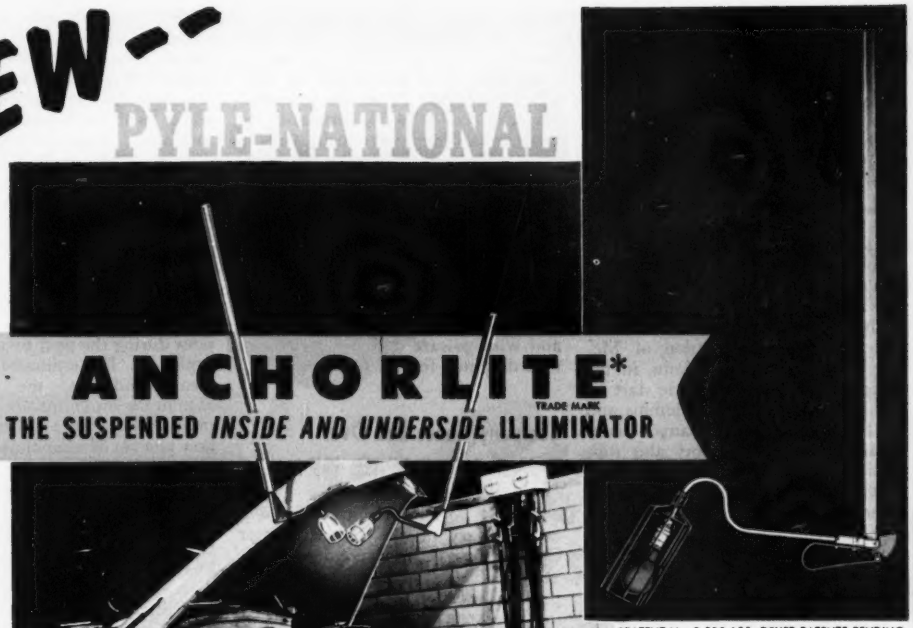
The new heater is installed by the City Light range repair crew where a splice of not more than 6 ft is required.

Each electric side-arm that is replaced with an electric automatic storage water heater releases at least 2,000 w of critical capacity for other uses, according to City Light estimates.

● **Employment** at the U. S. Atomic Energy Commission's reactor testing station in Idaho will be increased from 600 to 1,600 by Dec. 31. Principal employers of these permanent workers will be the AEC, American Cyanamid Co., Argonne National Laboratory, Phillips Petroleum Co., Western Equipment Co. and Westinghouse Electric Corp. By late summer, construction workers on the project will increase from 2,300 to about 3,200.

NEW--

PYLE-NATIONAL



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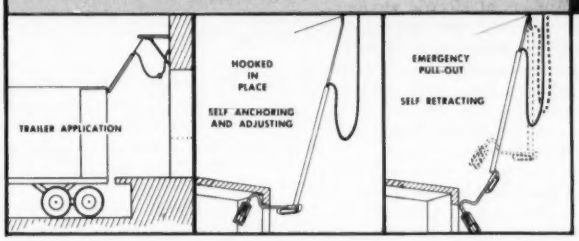

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- **REDUCES FIRE AND ACCIDENT HAZARDS**

Only the Pyle-National Anchorlite completely answers your need for a convenient, economical source of good lighting, temporarily required in auto repair shops and service garages—in fact, anywhere where inside and underside illumination is vital to efficiency. Anchorlite does away with hooks, reels and entangling leads. Self-anchored above any localized work area you choose, it is self-retracting and self-adiusting. Spring tension anchors it in position for use without other means of holding, takes care of height variations up to 3 feet; should the auto move, Anchorlite releases itself automatically! It is suspended overhead where it is out of the way, yet always convenient and easy to reach when needed. It is also designed to be suspended from a messenger wire on which it can slide the full length of the garage.

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TWO MILLION KILOWATT EXPANSION RECOMMENDED

Expansion of Pacific Northwest power resources to add more than 2 million kilowatts of installed capacity by 1953-54 is recommended in the Bonneville Power Administration's 1951 advance program for defense. This expansion would be a part of the 20-million-kw increase for the entire nation as requested in President Truman's 1951 economic report to Congress.

The program outlined in the report proposes faster construction of McNary and Chief Joseph dams, in the Columbia, and an immediate start on The Dalles Dam in the Columbia and Ice Harbor and Hell's Canyon dams in the Snake. The report also supports the proposed intertie between Oregon and California transmission systems.

Other federal power projects listed as necessary to bring the area's power generation up to requirements include installation of final generators at Grand Coulee Dam, and completion of Hungry Horse, Detroit, Big Cliff, Lookout Point, Dexter, American Falls and Albani Falls dams. Projects recommended for construction are Libby, Rose, Chandler, Lower Scriver, Upper Scriver, Garden Valley, Palisades, Lower Monumental, Little Goose, Hills Creek, and 300,000 kw of new steam generation.

Additions to network transmission facilities recommended include completion of four new 230,000-v circuits: Vancouver, Wash.—McNary Dam; Chemawa, Ore.—Detroit Dam; Baker, Ore.—McNary Dam; Roseburg—Coos Bay, Ore.

Immediate defense additions are limited primarily to acceleration of existing schedules, interconnection with Rock Island Dam and new non-federal generation and the Oregon-California intertie, the report says.

In the non-federal utilities field, construction already in progress or certified by the Defense Electric Power Administration, calls for installation of 1,150,000 kw of new peaking capacity by 1954-55. These projects include: Ross and Gorge plants, city of Seattle; Cushman plant, city of Tacoma; Rock Island Dam, Chalan County (Wash.) PUD; Box Canyon Dam, Pend Oreille County PUD; seven Umpqua River plants in Oregon, California-Oregon Power Co.; Bliss project, Idaho Power Co.; steam plant, Montana Power Co.; River Mill plant, Portland General Electric Co.; Cabinet Gorge, Washington Water Power Co.; Yale project, Pacific Power & Light Co.

The report forecasts an increase in Bonneville firm power sales to industrial plants from an average of 721,000 kw in 1951-52, to an estimated 1,036,000 in 1954-55, primarily in light metals and chemicals. In the same period industrial sales on an interruptible basis are expected to increase from 175,000 kw to 513,000 kw.

Recommendations made in the advance program report were worked out by the Bonneville Power Administration in cooperation with the Bureau of Reclamation and Corps of Engineers regarding federal projects, and with private and public utilities regarding non-federal facilities.

Company Concerned Over Federal Commitments

Federal power commitments, based on Secretary of the Interior Oscar Chapman's recently announced policy of "calculated risks," heighten the possible severity of power shortages in the Pacific Northwest, officials of Portland General Electric Co. reported at the company's recent annual meeting.

James H. Polhemus, president, and Thomas W. Delzell, chairman of the board, both expressed concern over commitments by the Bonneville Power Administration in alloting large blocks of power to the aluminum industry. They implied that the "risk" calculated by Chapman falls entirely on existing consumers of electric service.

Polhemus reviewed the difficulties of PGE in obtaining a long-term contract for Bonneville power and criticized policies that have placed regular distributing agencies in a less favorable position than aluminum companies in obtaining power.

Proposals that private utilities produce steam-generated power to meet shortages in the event of unfavorable stream conditions, were scored by Dalzell, who said:

"I can assure you that your management has no intention of letting this company become financially embarrassed by excessive steam costs. Nor do we wish to have imposed upon our customers any unjustified and unfair rate increases merely to benefit "johnny-come-lately" industries who, under present federal policies, propose to own cheap hydro power, leaving higher costs of steam-generated power to be borne by the established tax-paying citizens of the region."

Replying to fears expressed by the PGE officials, Bonneville Administrator Paul J. Raver declared that new power commitments to aluminum companies would not jeopardize service to present customers. Raver explained that all such commitments are on an interruptible basis and power will be supplied only when available. Present commitments to utilities, even though interruptible, will be given priority over interruptible aluminum loads should curtailment or operation of higher-cost steam generation be necessary, Raver said.

Whether additional commitments for aluminum production can be fully honored will depend on water conditions during the next two years, Raver explained. He estimated that under ideal conditions, the interruptible aluminum commitments will result in production of an additional half-million pounds of aluminum for defense.

● **Although underbid** by an English firm, General Electric Co. has been awarded a $2,357,596 contract by the Corps of Engineers for three 15,800-kva generators to be installed in the Albani Falls Dam in northern Idaho. The English Electric Co. Ltd. of Stafford, England, bid low at $2,229,186, but "did not conform to specifications," said Lt. Col. J. P. Buehler, district engineer at Seattle.

● **Seattle city council** has determined that schools in the area outside the city but within the area served by facilities acquired by City Light from Puget Sound Power & Light Co. will get the same electric rate given Seattle schools. All schools served by the utility will pay a flat rate of 1.425c per kwh.

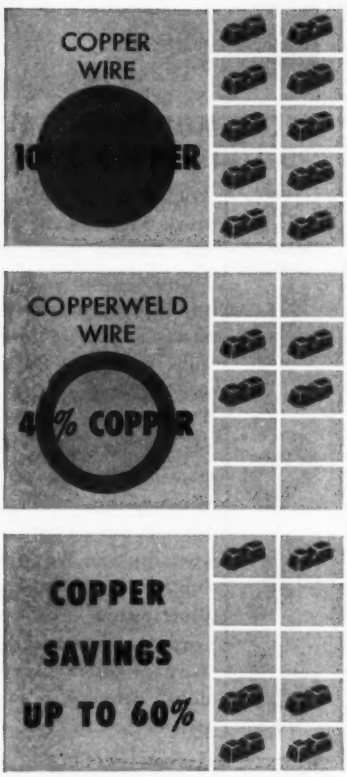
● **Franklin County PUD** of Pasco, Wash., has been authorized by the National Production Authority to build a $147,000 office building, according to Harry Hudlow, PUD manager. The building will have 7,000 sq ft of floor space, all on one floor; will be of masonry construction.

● **General Electric Co.** has been awarded a $449,525 contract by the Corps of Engineers for furnishing station service control boards, main control boards, and generator control cubicles for McNary Dam. Deliveries are to start by Jan. 1, 1952, and be completed by Jan. 1, 1954.

● **California Oregon Power** Co. has received a 10-year franchise from Lakeview, Ore. A 20-year franchise expired in May. In an earlier action the council had limited the right to three years. The company will pay the city 2% of gross receipts.

COPPER IS VITAL TO NATIONAL SECURITY—CONSERVE IT

Question: HOW CAN I  COPPER?



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CONDUCTIVITY . . . Copperweld* Power Conductors assure adequate electrical conductivity and use the minimum amount of copper necessary to do this job.

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PERMANENCE . . . Copperweld has all the rust-resistance of solid copper yet uses less copper.

TIME AND COST REDUCTIONS . . . Each year you'll save on repairs and maintenance because of Copperweld's unique combination of advantages. Man-hours and copper—both vital to you and to the National Security Program—are conserved and used with greater efficiency when you install Copperweld Power Conductors.

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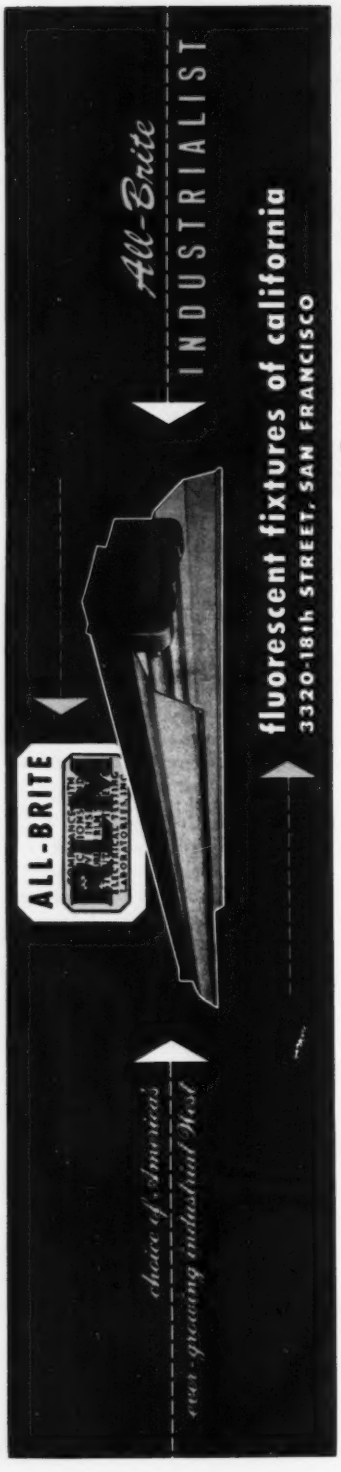
Pacific Coast Office: Monadnock Bldg., San Francisco

Copperweld TRADE MARK DEPENDABLE POWER CONDUCTORS

MADE BY THE EXCLUSIVE COPPERWELD MOLTEN-WELDING PROCESS



NEWS ABOUT PEOPLE

● **M. C. Heffelman** has been named operating vice-president of the Public Service Co. of New Mexico. He will be succeeded as Santa Fe division manager by **Ralph E. Loken,** formerly treasurer of the company. A graduate of the University of Arizona, Heffelman has been with the Public Service Co. and its predecessor for the past 18 years. Before going to Santa Fe as division manager, he served in the same capacity for the company's Deming properties. Previously he was associated with Central Arizona Light & Power at Phoenix and Tucson Gas, Electric Light & Power Co. at Tucson. Loken is a graduate of the University of New Mexico. He will be succeeded by **Ralph T. McBain** who will occupy the dual role of secretary-treasurer.

● **Lauren W. Grayson** has been appointed general manager and chief engineer of the Public Service Department, Glendale, Calif. He had held a similar position in the city of Riverside and had been superintendent of Riverside's power and water utilities since 1942. Grayson was chairman of the California section of the American Water Works Assn. in 1949 and is a present member of the board of directors of the California Municipal Utilities Assn. He succeeds the late Peter Diederich who died in November 1949. **Howard Gulich** has been acting head of the department.

● **Harold C. Hill** has been appointed assistant to the manager of General Electric Co.'s industrial division, apparatus department Pacific division. Manager of the user's section, industrial division, for the past eight years, he will take over duties that include further development of the industrial heating business in Los Angeles. An employee of G-E for nearly 40 years, Hill is a graduate of California Institute of Technology and has been with the Los Angeles organization since 1923. His post in the user's section will be filled by **R. E. Bear.**

● **Lawrence E. Karrer,** executive vice-president of Puget Sound Power & Light Co., has been elected to the board of directors of the Rotary Club of Seattle. The Seattle Rotary was the fourth to be organized anywhere in the world and is one of the largest of its kind, with a membership of 505.

"THE FINEST FITTINGS TO WORK WITH..."

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You get the finest "to work with" when you use Wagner Electrical Fittings. Tough, accurately cast, precision threaded, you're sure of uniform quality when they're Wagner's.

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● **Bradley Cozzens** has been promoted to assistant chief electrical engineer by the Los Angeles Department of Water & Power. **William S. Peterson,** assistant chief electrical engineer, will continue to act for Chief Electrical Engineer Charles P. Garman in his absence and will continue as chairman of the power system operations committee. Design and construction and power operating and maintenance divisions will report to Peterson. The business agent's and general plant divisions will report to Cozzens. Cozzens had been executive assistant to the general manager since 1947.

● **Frank A. Banks,** retired Grand Coulee project engineer, has been appointed chairman of the water management subcommittee of the Columbia Basin Interagency committee, with headquarters at Portland. In announcing the appointment, Paul J. Raver, BPA administrator and committee chairman, explained that water dispatching and stream-flow forecasting of various agencies concerned with flood control, power, irrigation and navigation will be coordinated through the new committee.

● **Donald G. Hartman** has been named application engineer at Fresno, Calif., for Westinghouse, succeeding **Robert M. Cogwill,** who has resigned. A native of Wyoming, Hartman was graduated from the University of Wyoming in 1947. Shortly after his graduation, he joined the Westinghouse graduate student training course at East Pittsburgh and in 1948 was transferred to the Portland office as application engineering assistant. He remained there until his assignment in Fresno.

● **Kenneth I. Billington,** formerly personnel director of the Clark County PUD at Vancouver, Wash., has been elected executive secretary of the Washington PUD Commissioners' Assn., with offices in Seattle. He replaces **John McCauley,** who has joined the staff of Congressman Henry Jackson in Washington, D. C.

● **Robert W. Coddington** has been appointed Upper Columbia district manager for the Bonneville Power Administration, Spokane, effective April 29. Coddington has served as acting manager since the death of Glenn H. Bell a year ago, and prior to that was district engineer. He will have full responsibility for all Bonneville utility operations in the Spokane district.

magno-tronic

DUAL SILVER POINT — FULLY AUTOMATIC

FLUORESCENT STARTERS

—completely eliminate annoying blinking and flickering of dead fluorescent lamps!

GUARANTEED — FOR ONE YEAR!

This is a glow switch condenserless precision starter equipped with automatic thermal relay circuit breaker. The relay automatically removes the lamp from the circuit electrically when the lamp becomes deactivated and automatically resets upon interruption of the lamp circuit.

SIMPLIFIES—Replacement of defective lamp automatically recycles starter circuit. No buttons to push—no replacement of starter.

REDUCES COST—Magno-Tronic starters provide exact timing of electrode heating, preventing excessive loss of emission materinl, thus assuring maximum possible lamp life.

VERSATILE—Built to operate efficiently over an extended voltage and temperature range.

SP-15-20 For use with 15 or 20 watt lamps.
SP-30-40 For use with 30 or 40 watt lamps.
SP-85-100 For use with 100 watt lamps.

Manufactured under U. S. PATENTS

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Capacitors
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Cotton Tapes, Webbings, Sleevings
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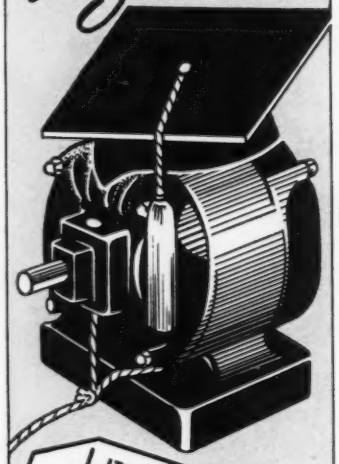

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Yes, motors and generators equipped with the proper brush *engineered* to the motor will *succeed* in giving maximum performance. We, with more than a quarter century of know how in the motor and generator brush field, can furnish you with the proper grade and type necessary for maximum output.

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● **Norris Nahman,** electronic engineering student at California State Polytechnic College, was named winner of the annual student paper contest sponsored by the Los Angeles Section of the Institute of Radio Engineers. Nahman, a senior from San Francisco, won top honors in competition with senior students from California Institute of Technology, University of Southern California, and University of California at Los Angeles.

● **Ramon A. Cayot** became manager of PG and E's Drum division on May 1, succeeding **James R. Johnson,** retired. A 27-year veteran with the company, Johnson had been Drum division manager since 1938. Cayot, who started with the company in 1918 as De Sabla power house operator, had been Auburn manager since 1950.

● **Daniel F. Villa** has been appointed manager of Pacific Gas and Electric Co.'s Humboldt division, succeeding the late Robert W. Muller. Employed by the company since 1913, he had been superintendent of electric transmission and distribution in the Humboldt division since 1945.

● **W. L. Winter,** application engineer for Westinghouse since 1906, has been made assistant to the manager of the central station department, Pacific Coast district. He will be assistant to **Frank E. Bodine** and will coordinate the promotion and sale of distribution apparatus throughout the district.

Deaths

● **Oscar G. Thompson,** 53, manager of the San Diego branch, General Electric Supply Corp., died May 11 at his home in San Diego. Mr. Thompson was a past president of the Bureau of Home Appliances and the San Diego Electric Club. He was one of the founders of the bureau's Home Appliance Show which annually draws upwards of 50,000 persons.

● **John Aldred Tookey,** general inside superintendent for Hume & Rumble Ltd., Vancouver, B. C., electrical contractors, died at Vancouver recently. Before moving to Vancouver in 1941, Mr. Tookey was electrical inspector for City of Winnipeg. He also operated his own electrical business in the Manitoba capital for several years.

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CONSTANT WATTAGE BALLASTS

deliver

more lumens per watt

through exclusive circuit design for minimum operating cost

The greater efficiency of SOLA Sequenstart* Ballasts is possible through a large reduction in core and coil loss, ordinarily dissipated as heat in conventionally designed ballasts. Consequently, the energy supplied by SOLA Sequenstart* Ballasts is more efficiently utilized in producing desirable light, rather than heat. You'll like the way these ballasts deliver more light for the same power cost . . . and do it continuously, quietly, and with little or no maintenance. Specify SOLA Sequenstart* Ballasts on your next fluorescent lighting installation. Notice the difference that this performance engineered lighting transformer will make in the satisfaction of your customers with your job.

Compare SOLA SEQUENSTART* with any other ballast.

Here are the significant advantages:
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- Less wattage loss, lighter in weight and more compact.

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Compare ballast performance—then specify the outstanding performer.

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CHANCE

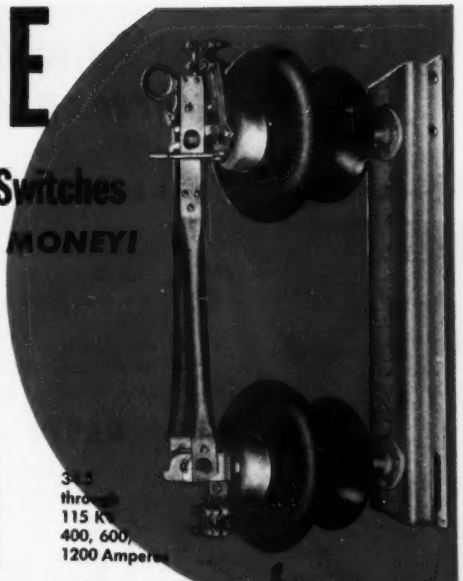
Hook Stick Disconnect Switches

... MORE FOR YOUR MONEY!

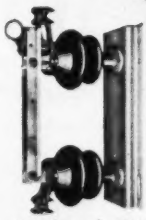
Chance Type BT Hook Stick Operated Disconnect Switches are made in a complete range of capacities for all types of single pole disconnect switch installations. They are available in single, tandem, or double throw types for horizontal mountings—upright, underhung, or vertical mountings up to 115 KV.

Dependable operation is inherent in their sturdy construction . . . RIGID CONTACT BLADES withstand heavy side thrusts, even if the closing force must be applied from an angle. Switches from 34.5 through 115 KV have a double tubular trussed blade which gives unequalled strength plus blade guides at the tongue which aid in contact alignment. 400 and 600 ampere switches rated 23 KV and below have reinforcing flanges on blades which increase rigidity and act as blade guides for closing the switch from an "out of line" position. 1200 ampere switches rated 23 KV and below have flat rigid parallel bus bar blades.

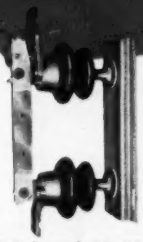
All Chance BT Switches have flanged bases that will not cut into wood supporting structures. Each size has been tested in accordance with A. I. E. E.-NEMA standards. Heat runs, high current tests, icing tests, insulation characteristics and life tests have proven the reliability of Chance Type BT Switches under all normal conditions.



34.5 thro 115 K 400, 600 1200 Ampere



7.5 through 23 KV 400, 600 Amperes

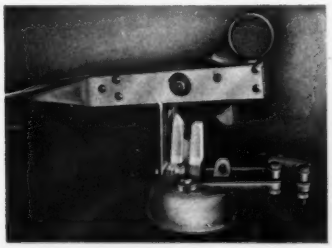


7.5 through 23 KV 1200 Amperes

Powerful Pryout for EASY OPERATION

A powerful lever action has been built into the pull ring mechanism and enables the operator to break ice or overcome clip adhesions with ease. All 400 and 600 ampere switches are equipped with time-saving built-in universal terminals. 1200 ampere switches have NEMA standard 4 hole terminal pads. Terminal lugs will be furnished on request.

Pressure Centered LONG LIFE Contacts



Pressure at the clip end is created by a conical compression spring combined with spherical washers. Split Tongue Contact casting "centers" spring pressure directly over contact area. All contacts are heavily silver plated on 1200 ampere switches. Lower ampere switches can be furnished with silver to silver or copper to copper contacts.

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You know it's RIGHT when you specify CHANCE

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Keep Harmony between Trees and Wires

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Practically all your small transformer needs are supplied by the Complete Jeffries line. We have specialized for years in providing transformer to exactly match your requirements. If not in our regular line, we build to meet your specifications in a hurry!

Minimize your voltage losses. Specify scattered transformers to eliminate duplicate conduit runs, and save on power costs.

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ALL the strength and durability inherent in steel are combined—with definite economies—in *Crapo* Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.

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NOTES ON THE TRADE

● **Arthur B. Kinley** and **Wayne L. Smith** have been named general machinery division sales representatives in Allis-Chalmers district offices in the West. Kinley has been assigned to the Spokane office where he will specialize in selling equipment for the cement, mining and rock products industries. Smith, an electrical engineer, is now with the Denver district office.

● **Robert J. Haldeman** has been appointed manager of Packard-Bell's Los Angeles factory service department, Thomas L. Stevens, service division manager, announced recently. As service manager, Haldeman will be in charge of Packard-Bell substations in Beverly Hills, South Gate, Santa Ana and Riverside, as well as the metropolitan department.

● **Appointment** of Appliance Distributors, with headquarters in Tucson and Phoenix, as distributor for Thor home laundry products in Arizona and Clark County, Nev., has been announced. **G. A. Larriva** is general manager at the Tucson office. **Rene Larriva** is manager at Phoenix.

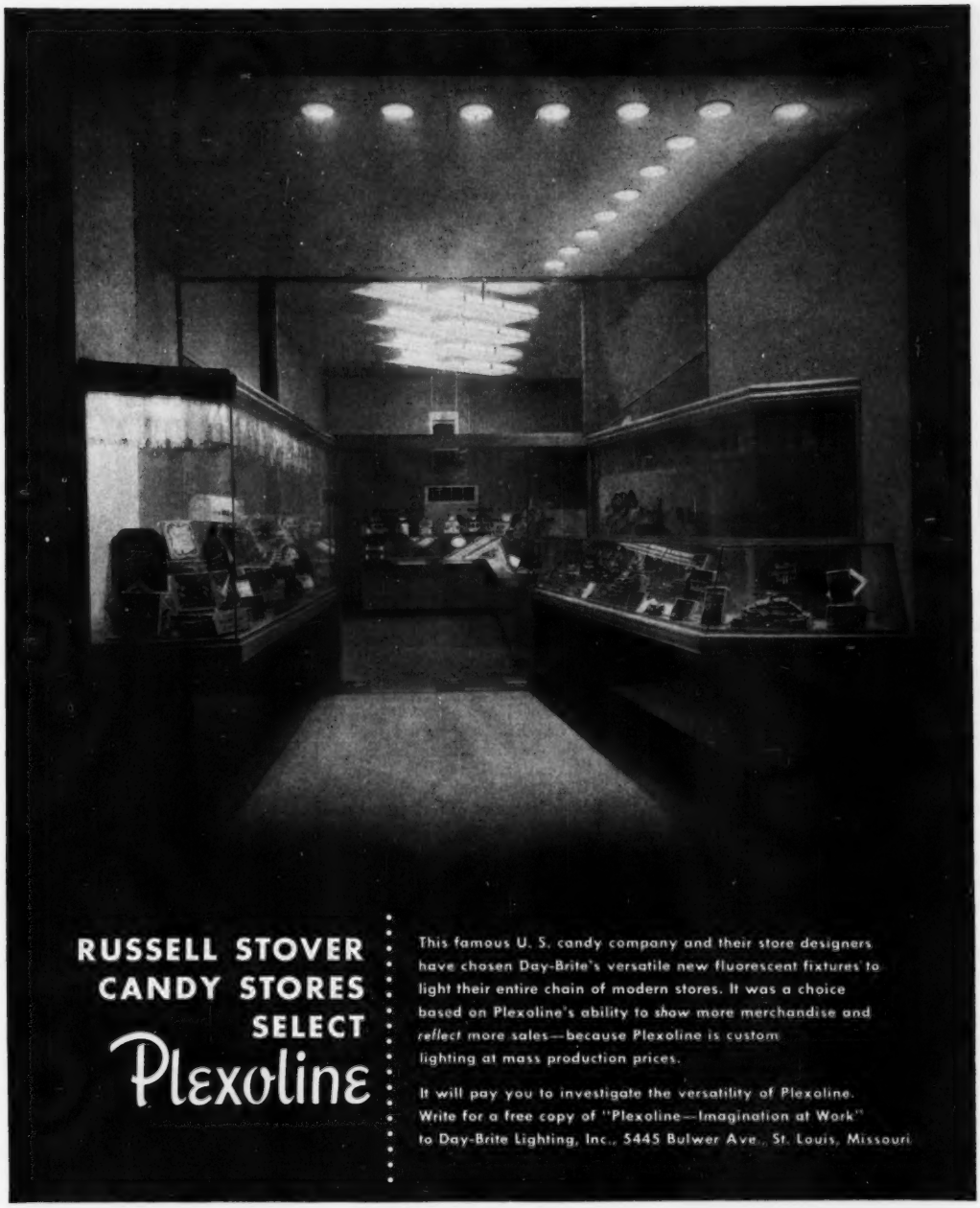
● **John F. Ingle** has been made San Francisco district manager for Sterling Electric Motors Inc. He will serve central and northern California and western Nevada. **Melvin Maxham** and **John Malloy** have been added to Sterling's Los Angeles sales staff.

● **Victor O. Ray,** formerly of Los Angeles, has been named Pacific Coast district engineering representative for the Aircraft department, Westinghouse Electric Corp., headquartered at San Francisco.

● **Ray Thomas Co.,** 1601 S. Hope St., Los Angeles, has been franchised as distributor for the Mitchell line of window-type room air conditioners. Charles Crawford is president of the Los Angeles firm.

● **Landers, Frary & Clark** has appointed **Leo J. Meyberg,** San Francisco and Los Angeles, as distributor for Universal appliances.

● **Pacific Electric Sales Co.,** factory representative, has moved to its own office and warehouse at 140 S. E. 28th Ave., Portland 15.



RUSSELL STOVER CANDY STORES SELECT

Plexoline

This famous U. S. candy company and their store designers have chosen Day-Brite's versatile new fluorescent fixtures to light their entire chain of modern stores. It was a choice based on Plexoline's ability to show more merchandise and *reflect* more sales—because Plexoline is custom lighting at mass production prices.

It will pay you to investigate the versatility of Plexoline. Write for a free copy of "Plexoline—Imagination at Work" to Day-Brite Lighting, Inc., 5445 Bulwer Ave., St. Louis, Missouri

NOW, MORE THAN EVER

AMERICA MUST SEE WHAT IT'S DOING!

IT'S EASY TO SEE WHEN IT'S

"DECIDEDLY BETTER"
DAY-BRITE
Lighting Fixtures

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One Call for All!

TAYLOR Fiber
BELDEN Lead Wire
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IDEAL Shop Tools
AEROVOX Capacitors
OHIO Carbon Brushes
INMANCO Slot Wedges
KIRKWOOD Commutators
HOOVER Ball Bearings
ANACONDA Magnet Wire
CROWN Winding Drives
DOW CORNING Silicones
ELIZABETH Cotton Tape
AMERICAN Banding Wire
VARTEX Varnished Cloth
MINNESOTA Scotch Tapes
BEAR Dynamic Balancers
BUNTING Bearings & Bars
DOLPH'S Insulating Compounds
OWENS CORNING Fiberglas
DIEFLEX Varnished Tubing
DIELECTRIC Friction Tape
COTTRELL Insulating Paper
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● **Parent organization** of Thermador Electrical Mfg. Co. of Los Angeles has changed its name from Norris Stamping & Mfg. Co. to Norris-Thermador Corp. There will be no change in the financial structure of the corporation or its subsidiary. According to William E. Cranston, Thermador president, for the foreseeable future, Thermador will continue to operate as a separate corporation.

● **After 25 years** in one location, Gilson Supply Co., Oakland, Calif., wholesale distributor of electrical supplies, has moved into new and larger quarters at 1148 E. 18th St. The new location covers 45,000 sq ft of ground floor space and has parking facilities. A drive-in permits customers to drive into and through the building to load materials. Partners in the firm are **William Figroid,** manager; **Charles Martin** and **Herbert Dowd.**

● **Boeing Airplane Co.** at Renton, Wash., has begun production of 18,000 high-tension power line suspension clamps for the Bonneville Power Administration under a $140,000 contract. The production line has five employees on one shift, with an output of about 360 clamps a day. The operation is almost entirely self-sufficient.

● **W. R. Eby** has been named manager of the Pacific district of York Corp., succeeding **Rodney F. Lauer,** now a vice-president. **Thomas A. Marshall** of Alameda, Calif., takes Eby's former position as industrial sales manager for the Pacific district, with headquarters in Los Angeles. Succeeding Marshall as San Francisco branch manager is **Dow D. Stone,** formerly sales engineer.

● **Wilcox-Gay** Corp. of Charlotte, Mich., has leased a manufacturing plant in Burbank, Calif., which it will use for manufacture of Majestic television and radio receivers and Wilcox-Gay Recordios for West Coast distribution. The plant has 85,000 sq ft of floor space, with provisions for expansion.

● **Paul E. Vance,** mid-Western representative for Buchanan Electric Products Corp., who covers Wyoming and Colorado, has moved his office to 2226 Transportation Bldg., 608 S. Dearborn St., Chicago 5.

● **Oliver B. Lyman,** 55 New Montgomery St., San Francisco 5, has been appointed representative for Pringle Electrical Mfg. Co. of Philadelphia, makers of bolted pressure switches.

ALWAYS SPECIFY THE BEST
WHITER THAN WHITE
ABOLITE Lighting
• Industrial
• Commercial Floodlighting
• Pump Island Installations
The JONES METAL PRODUCTS CO.
WEST LAFAYETTE, OHIO
Sold Exclusively through Electrical Wholesalers

Insulated BUSHENDS®
METALLIC CONDUIT BUSHINGS for PEAK PERFORMANCE
RUGGED • LIGHTWEIGHT
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HIGH DIELECTRIC STRENGTH INSULATION
Provides absolute protection against abrasion of cable insulation and accidental grounds. Available in sizes ½"—6" incl.
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Position Open

Electrical Engineer, under 45, for permanent supervisory position with California Public Utility. Excellent opportunity. Should have at least 5 years recent experience on electric utility system design and operation. Submit complete personal history and experience, including earning record, with letter of application. Salary open.

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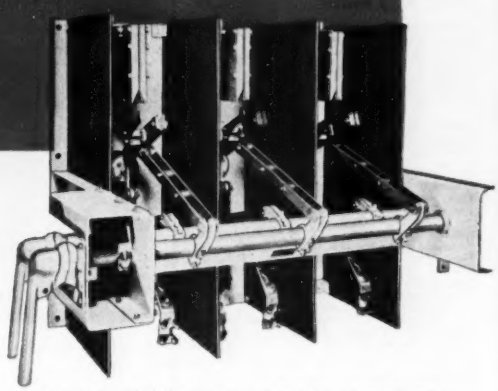
FOR SAFETY'S SAKE USE "SL" INTERRUPTER SWITCHES

The Delta-Star "SL" Interrupter Switch is a thoroughly tested and proved device which serves the dual purpose of interrupter and disconnecting switch. Opening under load is accomplished without danger of arcing or contact burning.

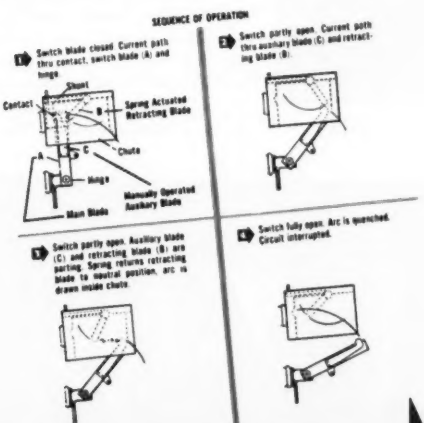


Indoor Type "SL" Interrupter and transfer selector switch 5000 volt, 400-AMP, continuous, 400-AMP interrupting capacity.

There are numerous applications in system operation for disconnecting switches capable of safely opening high-voltage currents under moderate load. Among these applications are (1) disconnecting of individual transformers from primary feeders (2) sectionalizing loop circuits (3) isolating capacitors (4) interrupting exciter current of voltage regulators (5) for fault protection when used with power fuses.

The "SL" Interrupter Switch can be supplied in single-pole, two-pole and three-pole units for hook-stick or remote control. It is also available as a complete unit for mounting directly on transformers. Metal enclosures are optional.

Available in voltage ratings 5, 7.5 and 15-kv, at interrupter ratings of 400, 200 and 100 amperes respectively. Continuous ratings can be in excess of interrupter ratings since main disconnect is independent of interrupter unit.


SEQUENCE OF OPERATION
1 Switch blade closed. Current path thru contact, switch blade (A) and hinge
2 Switch partly open. Current path thru auxiliary blade (C) and retracting blade (B).
3 Switch partly open. Auxiliary blade (C) and retracting blade (B) are parting. Spring returns retracting blade to neutral position, arc is drawn inside chute.
4 Switch fully open. Arc is quenched. Circuit interrupted.
Shunt
Contact
Spring Actuated Retracting Blade
Chute
Hinge
Manually Operated Auxiliary Blade
Main Blade

The "SL" Interrupter Switch is a NEMA Class A device capable of a minimum of 500 operations at full rated load without maintenance. Interrupting unit is located in a by pass circuit through which current is shunted momentarily when main switch is opened. Interruption is accomplished by means of a quick-break blade action. This action rapidly elongates and draws the arc toward the base of, and within a confining chute. The lining of this chute when heated generates gases favorable to arc extinction.

All the features of Delta-Star indoor disconnects so widely accepted in the field are incorporated in the "SL" Interrupter Switch. Hinge and contact are of the high pressure line type. Wiping action assures clean contacts. Contacts tend to harden and polish. Insulating materials are of highest quality, liberally designed to prevent warping and deterioration.

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DIVISION OF H. K. PORTER COMPANY, INC.

2437 Fulton Street • Chicago 12, Illinois

DISTRICT OFFICES IN PRINCIPAL CITIES

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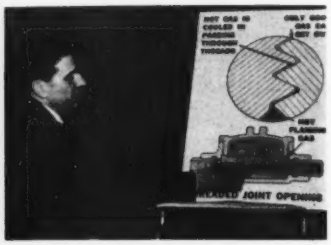
PROFILES

Rising



Vieau

Christensen Brazier

Echoes from the IAEI meetings in the mountain region last month are reflected here. Above, T. J. Vieau of Crouse-Hinds shows what happens when gas explodes in a fitting, at Rocky Mountain Chapter meeting, Denver. Left, above, Harold W. Rising receives token of esteem from the Idaho Chapter as he ends a long service as chapter secretary. Left, Loren Christensen, new Salt Lake City chief inspector, explains city ordinance to E. E. Brazier, retired G-E Supply manager and former IEA manager, at Utah Chapter meeting. Below, the officers of the Montana Chapter—Walter Lindsay, Havre, secretary; Earl Buehling, Brady REA, past chairman, congratulating new chairman "Doc" M. J. Rhodes, REA, Huntley; and Ken Jenkins, Sun River Electric Coop., Fairfield, new vice-chairman of the Montana Chapter the story of whose meeting was carried in the May issue, p. 100, without benefit of pictures because of lack of time

Lindsay Buehling Rhodes Jenkins

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